
Characterization of Infectious Waste

Purpose

The intent of this information bulletin is to emphasize the process of characterizing infectious waste and assist stakeholders in implementing proper waste management procedures. This bulletin also outlines the process of identifying and classifying infectious waste that may contain or is potentially contaminated with SARS-CoV-2. SARS-CoV-2 causes the disease known as Coronavirus disease (Covid-19).

Background

The Coronavirus (Covid-19) pandemic has brought the attention of infectious waste to the fore due to the generation of waste in higher volumes and from non-traditional healthcare settings.

In addition to the traditional hospital settings where patient care is provided for confirmed Covid-19 infections, temporary testing sites, immunization clinics, testing laboratories as well as decontamination activities are also generating infectious wastes. This new development has created some ambiguity of how the infectious waste should be correctly characterized before being subjected to the proper waste management approach.

Applicability

This bulletin is primarily intended for use by waste managers at sites generating medical wastes that are infectious, but also contains information useful to transporters and receivers to facilitate compliance with hazardous waste legislation.

Disclaimer: This bulletin does not replace the text of any act or regulation in any way, nor does it replace any legislation and has no legal force in itself. This bulletin is designed only as an information guide, to be read in conjunction with applicable federal and provincial legislation.

What are infectious substances?

Infectious substances are substances which are known or are reasonably expected to contain pathogens. Pathogens are defined as micro-organisms (including bacteria, viruses, rickettsiae, parasites, fungi) and other agents such as prions, which can cause disease in humans or animals.

Classification of infectious substances

A product, substance or organism is classified as dangerous good if it meets the criteria of one or more classes defined by the Federal Transportation of Dangerous Goods Regulations (TDGR). Infectious substances are classified as Class 6.2, Infectious Substances dangerous goods. Infectious substances are further divided into two categories according to the degree of hazard: Category A and Category B. Classification of an infectious substance must be made according to the material's composition, the type of pathogen present and the level of risk it poses to human or animal health.

Figure 1 shows a simplified overview of the process of classifying infectious substances.

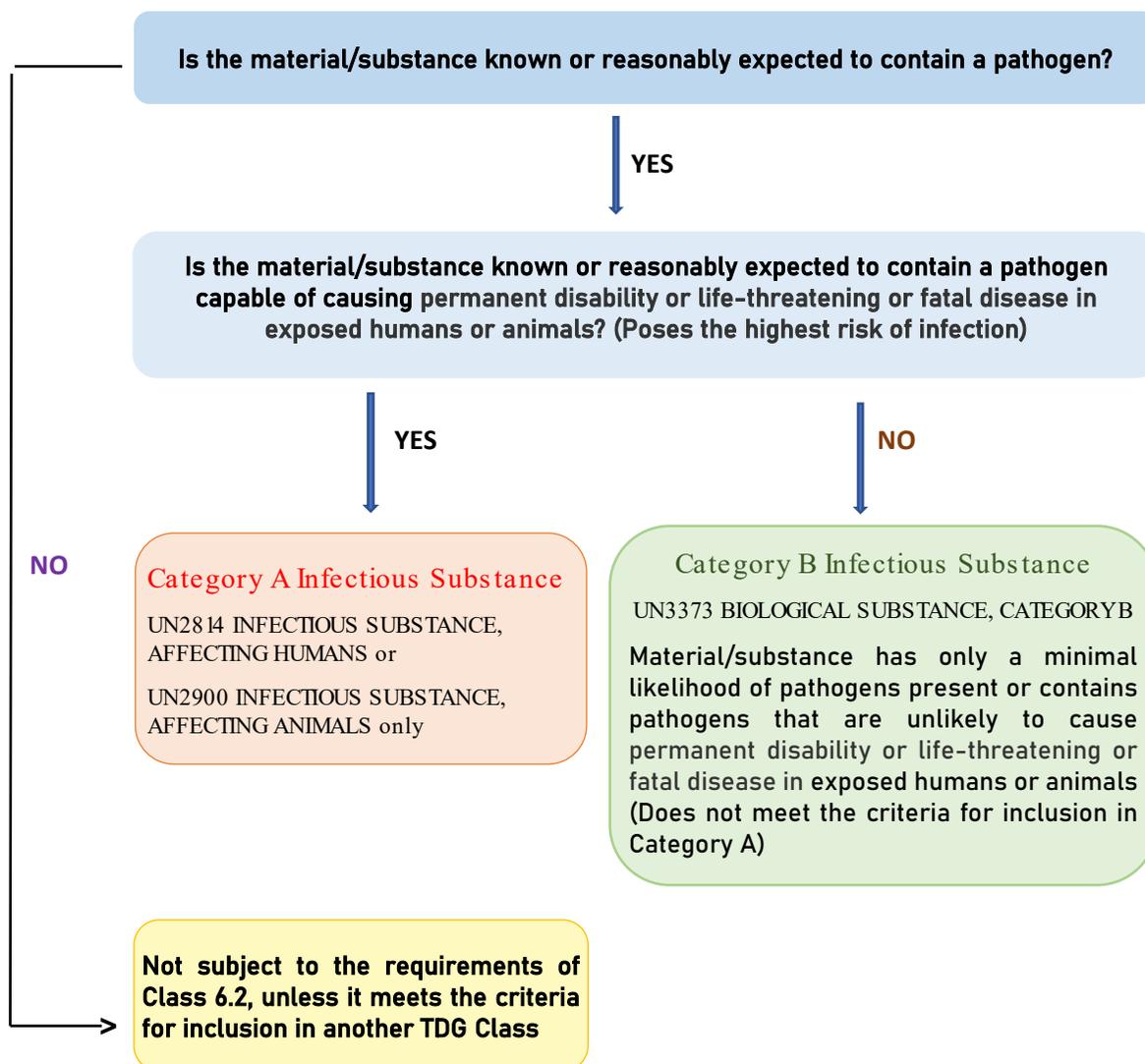


Figure 1: A simplified flowchart of the process of classifying Infectious Substances

Category A and Category B

Category A – An infectious substance in a form capable of causing permanent disability or life-threatening or fatal disease in otherwise healthy individuals or animals when exposure to it occurs (poses the highest risk of infection).

Examples of substances that meet these criteria are listed in Appendix 3 in Part 2 of the TDGR, however the tables in Appendix 3 are not exhaustive. Infectious substances, including new or emerging pathogens, which do not appear in the table but which meet the same criteria shall be assigned to Category A. In addition, if there is doubt as to whether or not a substance meets the criteria, it shall be included in Category A.

There are two different UN numbers and proper shipping names associated with Category A infectious substances.

- Infectious substances capable of causing disease in humans, or both humans and animals, are assigned to:

UN2814 – INFECTIOUS SUBSTANCE, AFFECTING HUMANS

- Infectious substances capable of causing disease only in animals are assigned to:

UN2900 – INFECTIOUS SUBSTANCE, AFFECTING ANIMALS only

Assignment to UN2814 or UN2900 shall be based on the known medical history and symptoms of the source human or animal, endemic local conditions, or professional judgment concerning individual circumstances of the source human or animal.

Category B – An infectious substance that is **not** in a form generally capable of causing permanent disability or life-threatening or fatal disease in otherwise healthy humans or animals when exposure to it occurs (does not meet the criteria for inclusion in Category A).

Biological materials containing pathogens which do not meet the criteria for Category A shall be assigned to Category B. The proper shipping name of a Category B infectious substance is:

UN3373 – BIOLOGICAL SUBSTANCE, CATEGORY B

What are Medical or Clinical Wastes?

These are wastes that contain infectious or potentially infectious substances (waste capable of producing an infectious disease), and are derived from the medical diagnosis, treatment or immunization of humans or animals or from biomedical research.

Some examples of medical or clinical wastes

- Waste contaminated with blood or other body fluids; discarded diagnostic samples; dressings, bandages, swabs, gloves, masks, gowns, drapes and other material contaminated with blood or other body fluids; waste that has been in contact with the blood of patients undergoing haemodialysis;
- Cultures and stocks of infectious agents from laboratory work; waste from autopsies, animal bodies, and other waste items that have been inoculated, infected, or in contact with infectious substances; discarded instruments or materials that have been in contact with persons or animals infected with infectious pathogens;
- Waste from patients infected with infectious diseases in isolation wards - it includes dressings from surgical wounds, and clothes heavily soiled with human blood or other body fluids;
- Contaminated sharps (e.g., hypodermic, intravenous or other needles; auto-disable syringes; syringes with attached needles; infusion sets; scalpels; pipettes; knives; blades; broken glass)

If the medical or clinical wastes contain Category A infectious substances, they can be assigned:

- UN2814 – INFECTIOUS SUBSTANCE, AFFECTING HUMANS;
- UN2900 – INFECTIOUS SUBSTANCE, AFFECTING ANIMALS only

If the medical or clinical wastes contain Category B infectious substances or the generator has reasonable grounds to believe that there is a low probability the wastes contain infectious substances, they can be assigned:

- UN3291 – CLINICAL WASTE, UNSPECIFIED, N.O.S. or (BIO) MEDICAL WASTE, N.O.S. or REGULATED MEDICAL WASTE, N.O.S., (N.O.S. = Not Otherwise Specified)

Figure 2 shows a simplified overview of the process of identifying infectious medical wastes.

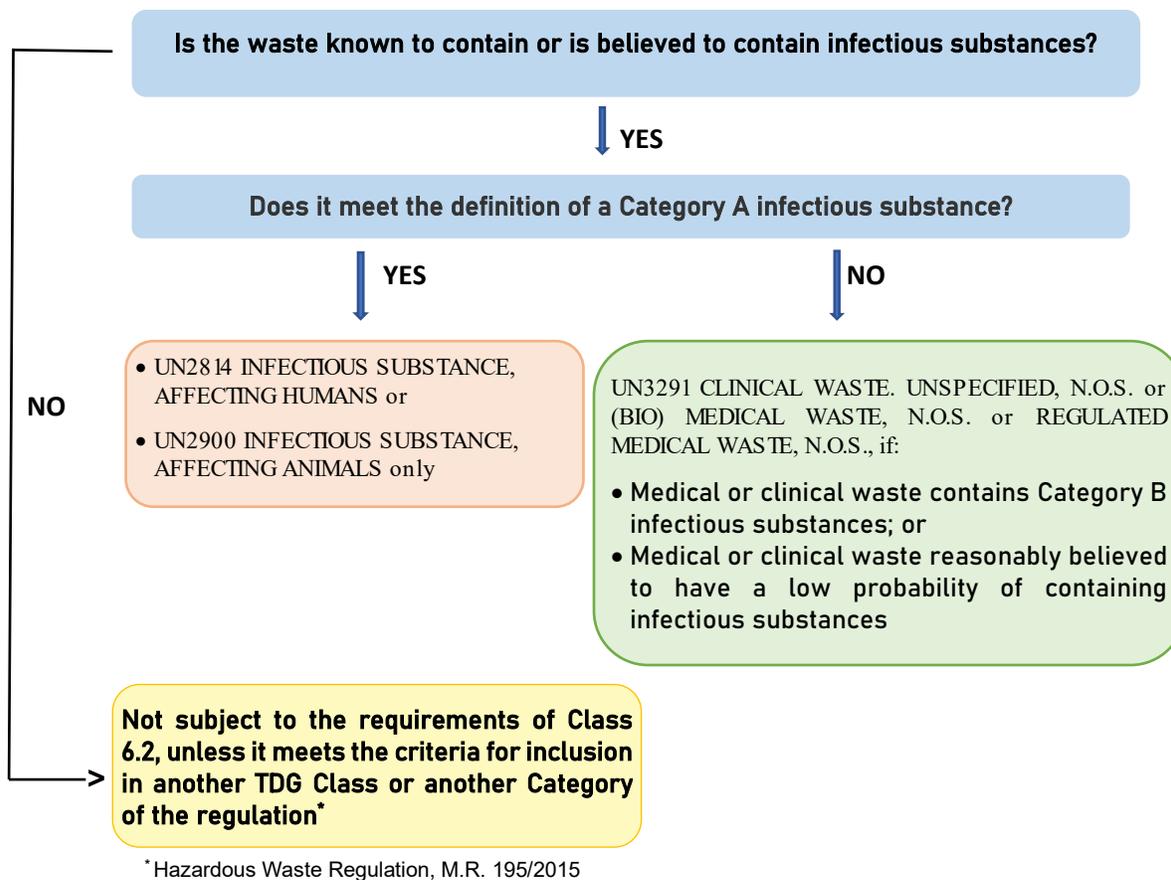


Figure 2: A simplified flowchart of the process of identifying and classifying Medical or Clinical Waste

Are Medical or Clinical Wastes Hazardous Wastes?

Because many hazardous wastes are dangerous goods as defined by the TDGR (which Manitoba has adopted), the Hazardous Waste Regulation, M.R. 195/2015 (regulation) pursuant to The Dangerous Goods Handling and Transportation Act (act) uses the same rules to define and classify hazardous wastes under Category 1 (of the regulation).

Therefore, any medical or clinical waste known or believed to contain infectious substances are regulated as hazardous waste and are subject to the regulation. This includes Category A and Category B infectious substances as well as waste that the generator has reasonable grounds to believe has a low probability of containing infectious substances.

Identification and classification of medical or clinical wastes containing SARS-CoV-2

Based on the classification established for infectious waste, medical or clinical wastes known or believed to contain the SARS-CoV-2 are identified and classified in the manner described in Table 1.

UN Number	TDG Shipping Name	TDG Class	Packing Group/ Category	Waste type
UN2814	INFECTIOUS SUBSTANCE, AFFECTING HUMANS	6.2	Category A	if wastes contain Category A infectious substances (e.g., propagated virus)
UN3291	CLINICAL WASTE, UNSPECIFIED, N.O.S.; or (BIO) MEDICAL WASTE, N.O.S.; or REGULATED MEDICAL WASTE, N.O.S.	6.2	Packing Group II	if wastes contain Category B infectious substances or there are reasonable grounds to believe that they have a low probability of containing SARS-CoV-2.

Table 1: Identification and classification of wastes associated with SARS-CoV-2

Exemptions

- Substances that do not contain infectious substances or that are unlikely to cause disease in humans or animals are not subject to the regulation, unless they meet the criteria for inclusion in another TDG Class or another Category of the regulation.
- Substances containing microorganisms that are non-pathogenic to humans or animals are not subject to the regulation, unless they meet the criteria for inclusion in another TDG Class or another Category of the regulation.
- Decontaminated medical or clinical wastes which previously contained infectious substances that no longer pose a health risk are not subject to the regulation, unless they meet the criteria for inclusion in another TDG Class or another Category of the regulation.

Managing Infectious Waste

Generation

A generator is the operator of a waste generation operation, whose act or process produces a hazardous waste. Generators include:

- the original generator of the waste (e.g., hospitals, doctors' offices, medical clinics, dental clinics, veterinary clinics, immunization clinics, laboratories, research facilities, etc.);
- the operator of a waste treatment and disposal facility that receives waste from generators; and
- the operator of a waste transfer or bulking facility that receives waste from generators and forwards off-site for subsequent waste management.

As an infectious waste generator, what are my responsibilities?

As a generator, you must comply with the requirements related to:

- Designation and Identification of hazardous waste
- Registration as a hazardous waste generator
- Segregation, packaging, labelling and on-site storage of waste
- On-site treatment or shipment for off-site treatment and disposal
- Placarding and documentation

Designation and Identification

Waste determination is the pivotal activity for properly identifying that your operation (and subsequent handlers) complies with the regulations for proper waste management. The generator is responsible for identifying the hazardous wastes.

To identify the classification of an infectious waste, a generator must consult the regulation and the TDGR. In the case of infectious substances, this activity is normally done by, or in consultation with, a doctor, scientist, veterinarian, epidemiologist, genetic engineer, microbiologist, pathologist, nurse, coroner or laboratory technologist or technician.

Who can I contact if I need assistance for classifying infectious substances?

You could contact the Transportation of Dangerous Goods Directorate, Public Health Agency of Canada (PHAC) or the Canadian Food Inspection Agency (CFIA) for advisory or assistance in the classification of infectious substances.

Hazardous waste generator registration

A generator must register the hazardous waste and receive a registration number (referred to as an MBG number) when the quantity generated in a month is equal to or greater than the quantity specified in Schedule F of the regulation. Registration is also required before a generator may permit the hazardous waste to leave the premises, when in quantities of five kilograms or five liters or greater. The registerable quantities for TDG Class 6.2 as per Schedule F of the regulation are listed in Table 2.

Waste Type / TDG Class	Category/Packing Group	Registerable Quantity
Class 6.2	Category A	Any quantity
Class 6.2	Category B	50 L or 50 Kg
Class 6.2	Packing Group II	50 L or 50 Kg

Table 2: Registerable quantities for TDG Class 6.2 as per Schedule F of the regulation.

The hazardous waste registration form to register a hazardous waste can be found on the [Hazardous Waste Program website](#).

Packaging, labelling and onsite storage

Storage requirements at the site of hazardous waste generation are regulated under the regulation. Generators are required to properly manage infectious wastes at their sites, and to ensure that the wastes are stored in an environmentally safe manner.

It is important that the waste container used is suitable for the type of infectious waste stored and is rigid, leak resistant, impervious to moisture, of sufficient strength to prevent tearing and bursting under normal conditions of use and handling and sealed to prevent leakage.

Packaging intended to contain sharps waste such as scalpel blades, hypodermic needles and syringes shall meet the requirements of Canadian Standards Association standard **CAN/CSA Z316.6, Sharps Injury Protection - Requirements and Test Methods - Sharps Containers** or be rigid, leak-proof, puncture resistant and designed for repeated use.

Cross border shipments

Out of province treatment and disposal

If infectious medical wastes are sent out of province for treatment and disposal, it is the responsibility of the consignee and the carrier to comply with all applicable regulations of the jurisdiction that accepts the waste.

Interprovincial and international shipments

Cross border shipments of hazardous wastes are regulated under the Canadian Environmental Protection Act. Information on the notification process and waste tracking requirements of the federal legislation can be obtained from Environment and Climate Change Canada.

Transport

Only licensed carriers may transport hazardous waste in Manitoba. Anyone who transports infectious waste in excess of five kilograms or five liters must have a valid licence and licence number (referred to as an MBC number) issued by the department and use a movement document.

Carrier responsibilities before picking up hazardous waste

The carrier must ensure that:

- the consignor is registered;
- the consignee is licensed or operating under a director's order or is authorized by the appropriate authorities in another jurisdiction; and
- the movement document is correctly filled out.

Carriers must also comply with requirements of the TDGR respecting transport of infectious substances. TDGR sets out specific details on the packaging requirements and specifications for the selection and use of standardized and non-standardized means of containment for the transport of Category A and Category B infectious substances as well as clinical, (bio) medical or regulated medical waste.

The licensed carrier, when transporting infectious waste, shall always ensure that:

- all applicable safety requirements are fulfilled;
- the shipment is accompanied by correctly filled out copies of movement documents; and
- the means of containment and means of transport comply with all applicable safety standards and display all applicable dangerous goods safety marks.

Documentation - Movement document

Each shipment of hazardous waste must be accompanied by a properly completed movement document if the quantity shipped is in excess of five kilograms or five liters. The movement document is filled by each of the three parties (consignor, carrier and consignee) involved in shipping the waste.

Blank movement documents are available for purchase from the following address in Manitoba:

Canada Map Sales
14 Fultz Blvd, Winnipeg MB R3Y 0L6
Tel: 204-945-6666 | Toll free: 1-877-627-7226 | Fax: 204-945-1365
Email: mapsales@gov.mb.ca
Website: <http://www.canadamapsales.com/en/index.html>

Disposal

To accept hazardous waste from a carrier, the consignee must be in possession of a licence or director's order to operate a hazardous waste disposal facility (for the treatment, disposal or bulk storage of hazardous waste) in Manitoba or operating a facility under an approval of similar type in another jurisdiction.

A hazardous waste receiver registration number (referred to as an MBR number) is also issued to the hazardous waste receivers by the department.

The consignee may only accept hazardous waste from licensed carriers, and must also make certain that the consignor is registered as a hazardous waste generator.

Licence to operate an Infectious medical waste disposal facility

The act requires licensing prior to construction, operation or alteration of hazardous waste disposal facilities. If you are unsure if your proposed activity or development requires a licence, please contact the Environmental Approvals Branch at:

Environmental Approvals Branch
Manitoba Environment and Climate Change
14 Fultz Blvd, Box 35, Winnipeg MB R37 0L6
General Inquiry: (204) 945-8321
Email: EABDirector@gov.mb.ca
Website: <https://www.gov.mb.ca/sd/about/environmental-stewardship/environmental-approvals/index.html>

Terms and definitions

For the purposes of this information bulletin, the following terms and definitions apply:

Act: This refers to The Dangerous Goods Handling and Transportation Act (act).

Carrier: A carrier is a person who is engaged in the transport of hazardous waste (*from the regulation*).

Category A: Category A means an infectious substance in a form capable of causing permanent disability, life-threatening or fatal disease in otherwise healthy individuals or animals when exposure to it occurs.

Category B: Category B means an infectious substance that is not in a form generally capable of causing permanent disability or life-threatening or fatal disease in otherwise healthy humans or animals when exposure to it occurs. It does not meet the criteria for inclusion in Category A.

Class: A class is a grouping of dangerous goods according to the hazards they present, as defined by the Transportation of Dangerous Goods Regulations, as amended from time to time.

Classification: Classification means, for dangerous goods, as applicable, the shipping name, the primary class, the compatibility group, the subsidiary class, the UN number, the packing group, and the infectious substance category.

Consignee: A consignee is a person to whom a consignment of hazardous waste is being or is intended to be transported.

Consignor: A consignor is a person who offers a consignment of hazardous waste for transport.

Container: A container is a single-use or reusable container or package, or the part of a means of transport, that is or may be used to contain any quantity of bulk or packaged goods, including, but not limited to, dangerous goods or contaminants (*from the act*).

CSA Z316.6: Canadian Standards Association CAN/CSA Z316.6-14, "Sharps Injury Protection - Requirements and Test Methods - Sharps Containers", published by the CSA Group.

Culture: Culture means the result of a process by which pathogens in a specimen are intentionally propagated. This does not include specimens taken from a human or animal patient and that are intended to be processed in a laboratory.

Dangerous good: A dangerous good is a product, substance or organism that: (a) is prescribed, designated or classified as a dangerous good or hazardous waste in the regulations, or (b) by its nature, conforms to the classification criteria for one or more classes of dangerous goods or hazardous wastes set out in the regulations (*from the act*).

Department: Department means the department of government over which the minister presides, and through which the act is administered (*from the act*).

Director: The director is an employee of the department so designated or appointed by the minister (*from the act*).

Disease: Disease is a disorder of structure or function in a living human or animal, or one of its parts, resulting from infection or intoxication. It is typically manifested by distinguishing signs and symptoms.

Generator: A generator is a person who, by virtue of ownership, operation, management or control causes or allows to cause the creation or storage of hazardous waste (*from the regulation*). [This includes the original generator of the waste, as well as all subsequent operations that are involved in the chain of custody of the waste, such as a transfer station or a storage facility that receives waste and then ships it to another receiver. When the waste moves from the transfer station to another receiver, the transfer station is considered to be the generator for the subsequent shipment from its facility].

Hazardous Waste: Hazardous waste is a product, substance or organism that: (a) is prescribed, designated or classified as hazardous waste in the regulations (b) by its nature conforms to the classification criteria for one or more classes of hazardous waste set out in the regulations (*from the act*).

Hazardous Waste Disposal Facility: This refers to a facility or place operated in whole or in part for the purpose of treatment, disposal or bulk storage of hazardous waste. It does not include a facility or place approved by the director: (a) that treats, stores or disposes of hazardous wastes on the generation site (b) that treats or stores hazardous wastes as part of a process for the recycling, reuse or reclamation of hazardous wastes (*from the act*).

Infectious Substance: means a substance known or reasonably believed to contain viable micro-organisms such as bacteria, viruses, rickettsia, parasites, fungi and other agents such as prions that are known or reasonably believed to cause disease in humans or animals and that are listed in Appendix 3 to Part 2 (Classification) of the Transportation of Dangerous Goods Regulations (TDGR) or that exhibit characteristics similar to a substance listed in Appendix 3 of the TDGR.

MBG Number: An MBG number is a unique provincial identification number issued by the director to a hazardous waste generator, also referred to as the generator registration number.

MBC Number: An MBC number is a unique provincial identification number issued by the director to a hazardous waste carrier, also referred to as the carrier licence number or carrier registration number.

MBR Number: An MBR number is a unique provincial identification number issued by the director to a hazardous waste receiver, also referred to as the receiver registration number.

Means of Containment: Means of containment refers to a container or packaging, or any part of a means of transport, that is or may be used to contain goods.

Medical or Clinical Waste: Medical or clinical wastes are wastes derived from the medical treatment of animals or humans or from bio-research.

Movement Document: A movement document is a numbered document, prescribed in the regulations, that relates to hazardous wastes that are being transported or offered for transport and that contains the information relating to the hazardous wastes required by the act or the regulations (*from the act*).

Packaging: Packaging includes receptacle and any other components or materials necessary for the receptacle to perform its containment function.

Packing group: Packing group means a group in which dangerous goods are included based on the inherent danger of the dangerous goods; Packing Group I indicates great danger, Packing Group II indicates medium danger and Packing Group III indicates minor danger.

Pathogen: Pathogen means a microorganism, nucleic acid, or protein capable of causing disease or infection in humans or animals. Examples of human pathogens are listed in Schedules 2 to 4 and in Part 2 of Schedule 5 of the Human Pathogens and Toxins Act, but these are not exhaustive lists. Examples of animal pathogens can be found through the Automated Import Reference System on the Canadian Food Inspection Agency website.

Prion: Prion is a small proteinaceous infectious particle generally considered to be responsible for causing a group of neurodegenerative diseases in humans and animals known as transmissible spongiform encephalopathies.

Receiver: A receiver is the operator of any facility to which waste is transferred by a carrier. This includes transfer stations, bulk storage facilities, processing facilities, treatment facilities or final disposal sites.

Safety mark: Safety mark means a design, symbol, device, sign, label, placard, letter, word, number or abbreviation, or any combination of these things, that is to be displayed (a) on dangerous goods, on means of containment or transport used in handling, offering for transport or transporting dangerous goods, or at facilities used in those activities; and (b) to show the nature of the danger or to indicate compliance with the safety standards prescribed for the means of containment or transport or the facilities (*from the act*).

Safety standard: Safety standard means a standard, prescribed in the regulations, regulating the design, construction, equipment, function or performance of containers or facilities used or intended to be used in transporting, offering for transport or otherwise handling dangerous goods (*from the act*).

SARS-CoV-2 (Severe acute respiratory syndrome coronavirus 2): This is the official name for this particular coronavirus which is responsible for the outbreak of COVID-19 disease. SARS-CoV-2 is classified as a Risk Group 3 (RG3) human pathogen and as a Risk Group 2 (RG2) animal pathogen.

Shipping Name: A shipping name is an entry in upper case letters (capitals) in column 2 of Schedule 1 of the Transportation of Dangerous Goods Regulations. It does not include any lower-case descriptive text, except for the purpose of determining the classification of dangerous goods.

Storage: Storage means the accumulation of hazardous wastes after segregation into a specified container(s).

Transport: This means to haul, move, convey or deliver hazardous waste, using a means of transport.

Transportation of Dangerous Goods Regulations: The Transportation of Dangerous Goods Regulations, SOR/2001-286, made under the Transportation of Dangerous Goods Act, 1992 (Canada), as amended from time to time (TDGR).

Treatment: Treatment means a process to change the biological or chemical character of waste to eliminate or significantly reduce potential infectious substances or harm contained in the waste. (*e.g., incineration, autoclave*)

UN Number: This is the four-digit identification number assigned to dangerous goods in accordance with the United Nations Model Regulations (an entry in column 1 of Schedule 1 of the Transportation of Dangerous Goods Regulations).

References

- CAN/CSA Z316.6-14 Sharps Injury Protection - Requirements and Test Methods - Sharps Containers. (2014). Mississauga, ON, Canada: Canadian Standards Association.
- Government of Canada. (2016). Canadian Biosafety Handbook, 2nd edition, 2016. Ottawa, ON, Canada: Government of Canada. Available from <https://www.canada.ca/en/public-health/services/canadian-biosafety-standards-guidelines/handbook-second-edition.html>
- Government of Canada. (2018). Canadian Biosafety Guideline – Local Risk Assessment. Available from <https://www.canada.ca/en/public-health/services/canadian-biosafety-standards-guidelines/guidance/canadian-biosafety-guidelines/document.html>
- Government of Canada. (2020). Biosafety advisory: SARS-CoV-2 (Severe acute respiratory syndrome-related coronavirus 2). Available from [Biosafety advisory: SARS-CoV-2 \(Severe acute respiratory syndrome-related coronavirus 2\) - Canada.ca](https://www.canada.ca/en/public-health/services/biosafety-advisory-sars-cov-2-severe-acute-respiratory-syndrome-related-coronavirus-2-canada-ca)
- Government of Canada. (2018). TDG Bulletin – Shipping Infectious Substances. Transport Canada.
- Guidance on regulations for the transport of infectious substances 2021-2022. Geneva: World Health Organization; 2021. Licence: CC BY-NC-SA 3.0 IGO.
- United Nations. Recommendations on the transport of dangerous goods: model regulations, 22nd revised edition. New York, Geneva: United Nations; 2021

Further information

- Manitoba Environment and Climate Change - Environmental Compliance and Enforcement Branch Hazardous Waste Program – Email: raj.rathamano@gov.mb.ca
Website: https://www.gov.mb.ca/sd/waste_management/hazardous_waste/index.html
- Transport Canada - Transportation of Dangerous Goods Prairie & Northern Region - Telephone: 1-888-463-0521- Email: TDG-TMDPNR@tc.gc.ca
Website: [Transportation of dangerous goods in Canada](https://www.tc.gc.ca/eng/transportation-of-dangerous-goods-in-canada)
- Public Health Agency of Canada
Telephone: 613-957-1779 - Email: phac.pathogens-pathogenes.aspc@canada.ca
Website: [Biosafety and biosecurity - Canada.ca](https://www.canada.ca/en/public-health/services/biosafety-and-biosecurity)
- Canadian Food Inspection Agency
Telephone: 613-773-5327 - Email: biocon@inspection.gc.ca
Website: [Canadian Food Inspection Agency \(canada.ca\)](https://www.inspection.gc.ca/canadian-food-inspection-agency)
- Environment and Climate Change Canada (Waste Reduction and Management Division)
Tel: 1-844-524-5295 Email: ec.dm-md.ec@canada.ca
Website: www.canada.ca/hazardous-waste