Influenza A H1N1

General guidance for the international shipment of samples for laboratory diagnostics

8 May 2009

Contents

Shipment of infectious substances can be very hazardous; it is the responsibility of the shipper to minimize these risks through proper packaging and documentation. This guidance to international shipment of potentially infectious substances was developed to assist shippers with classifying, documenting, marking, labelling, and packaging infectious substances. This document presents general guidance on international shipments, with a focus on influenza suspected samples or viruses. It is to be updated anytime if needed. In a separate document, detailed information is available for shipment to each of the diagnostic laboratories listed for swine influenza diagnostic. Requests for urgent assistance with shipments can be addressed by email to: empres-shipping-service@fao.org

A) Swine samples
Swine samples are often categorised as 'prohibited' or a 'restricted item' for import from countries where foot-and- mouth Disease (FMD) is known to exist, or when the status is unknown. Restrictions can take many forms. Some countries do not allow the import swine samples even if it is for diagnosis. In some cases, they can only receive inactivated RNA samples. Many countries also have specifically designated airports for arrival and receipt of any material for laboratory testing. Therefore, sending of swine samples to an international reference laboratory for confirmatory diagnosis requires prior consultation with the destination laboratory.

B) Actions before sending samples
Submission of samples to any laboratory outside the country of origin should always be subject to prior agreement between the veterinary authorities of the shipping country and the recipient laboratory (see the '*interim list of OFFLU laboratories*' for details).

C) Mode of transport
An international courier company specialised in infectious substance transport or airfreight[1] is usually used to send diagnostic samples to any laboratory outside the country of origin. If airfreight is to be used, a discussion with the recipient laboratory regarding the pick-up arrangement at the destination airport is necessary, as an airline company will not forward the airfreight shipment outside of the airport. Some countries have specifically designated airports as the first port of entry for certain types of samples (e.g. samples from cloven hoofed animals originating from FMD-infected countries), which will limit the possibility of using some airlines/couriers.

D) Preparation of shipment
Diagnostic samples, isolates of an animal disease pathogen, and dry ice are classified as Dangerous Goods – Infectious Substances and Dangerous Goods. Procedures governing the shipment of such substances are published by IATA[2] as Dangerous Goods Regulations (DGR) based on the rules set by UN/SCETDG[3] and ICAO[4]. Submission of samples to any laboratory by air should therefore follow the DGR and be transported in containers that meet the Packing Instruction (PI) described in the DGR. It is required that all personnel who handle the shipment of infectious substances be trained in related regulations in advance. See figure 1, and tables 1 and 2, for more information on Dangerous Goods categories.

Category of samples
Specimens collected directly from animals (or humans) that are suspected or confirmed to be infected with the influenza A (H1N1) virus, including specimens from the respiratory tract (swabs) and blood specimens, should be shipped as "BIOLOGICAL SUBSTANCE, CATEGORY B" and designated as UN 3373. Influenza A (H1N1) virus cultures (i.e. virus isolates) must be shipped as Category A "INFECTIOUS SUBSTANCE; AFFECTING HUMANS" and designated as UN 2814.
Shipping Category A substances requires shippers to have completed specific training. For shipping Category B substances or neutralised/inactivated samples (e.g. nucleic acid preparations (RNA samples) containing no viable virus), no specific training is required. If the shipment also includes other dangerous goods (such as liquid nitrogen or dry ice) shippers must be trained appropriately in the transport of those goods.

1 Airfreight is a counter-to-counter package transport system for the shipment of small parcels. These shipments have size, weight, and content restrictions, and usually may be dropped off and picked up at a ticket counter, luggage service or freight office.

2 International Air Transport Association

3 United Nations Economic and Social Council's Committee of Experts on the Transport of Dangerous Goods

4 International Civil Aviation Organization

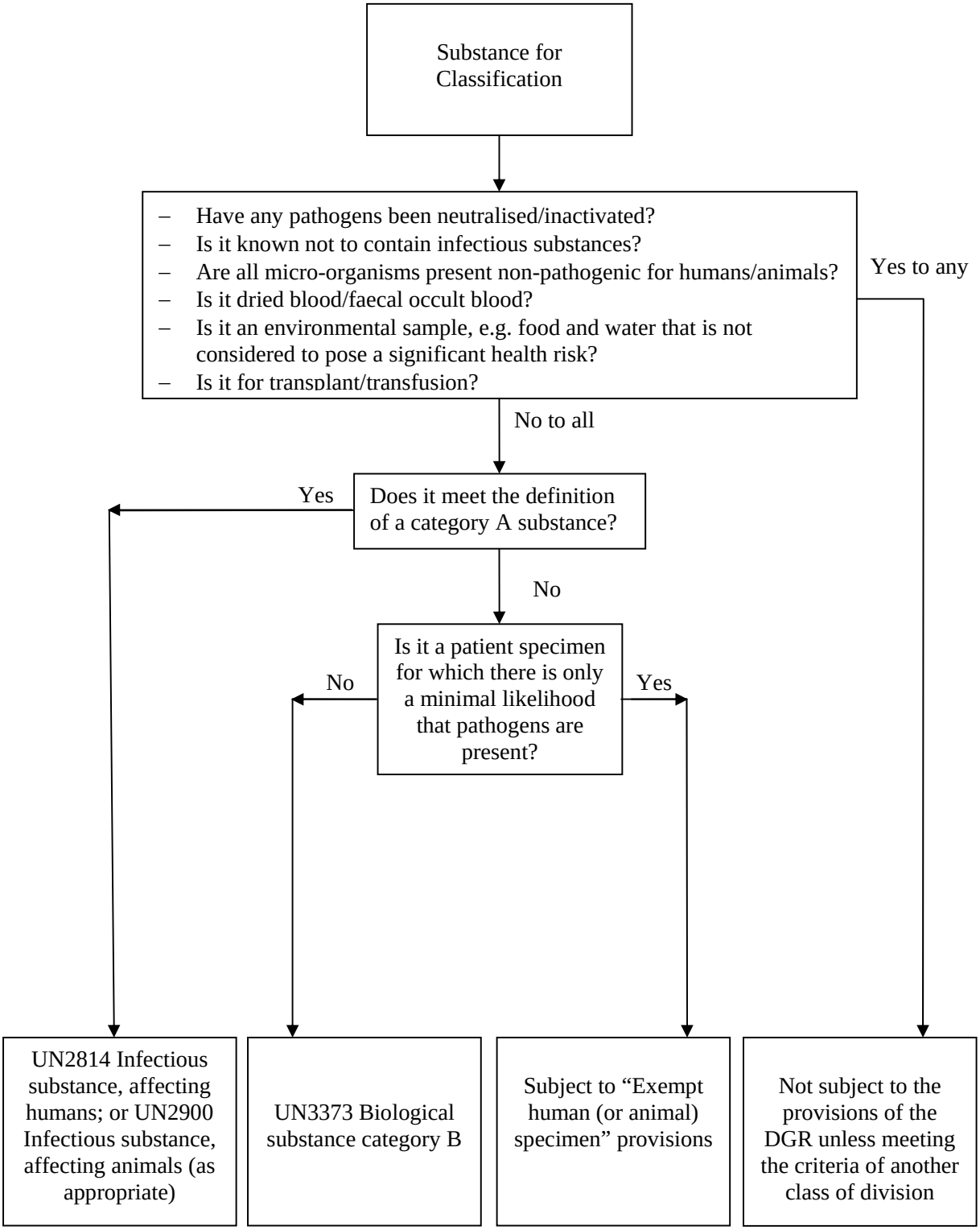


Figure 1. Dangerous Goods - infectious substance - classification flowchart
Source:http://www.iata.org/NR/rdonlyres/9C7E382B-2536-47CE-84B4-9A883ECFA040/0/Guidance_Doc62DGR_50.pdf

Table 1. Sample categories, UN codes, proper shipping names and examples

UN code	Definition	Proper shipping name	Class/ Division	Packing group	Packing Instruction	Susceptible species	Example
UN2814	Infectious substances meeting these criteria which cause disease in humans or both in humans and animals	Infectious substance, affecting humans	6.2	N/A[5]	PI602	Human; Human and animal	Highly pathogenic avian influenza virus isolates[6], Ebola virus, Nipah virus, **influenza A H1N1 virus isolates pathogenic to humans**
UN2900	Infectious substances which cause disease only in animals	Infectious substances, affecting animals	6.2	N/A	PI602	Animal only	Foot and mouth disease virus isolates, ASF virus isolates[6], Other influenza isolates of animal origin
UN3373	Infectious substance which does not meet the criteria for inclusion in Category A (UN2814 or UN2900)	Biological substance category B	6.2	N/A	PI650	Any	Samples for infectious disease diagnosis. (e.g. swab, serum samples for avian/**swine influenza diagnosis**)
No code (not dangerous goods)	Substances which do not contain infectious substances or substances which are unlikely to cause disease in humans or animals	N/A	N/A	N/A	N/A	Any	Samples for non-infectious disease diagnosis

Temperature conditions during the shipment

If samples (serum, plasma and fresh tissues) can be shipped to arrive at a laboratory within 24-48 hours, they can be packaged with frozen ice packs (which will maintain the samples at around 4°C during the transfer). Most frequently, samples for virus detection will have to be shipped by air and preserved in dry ice or in liquid nitrogen.

Table 2. Cooling materials

UN code	Item	Proper shipping name	Class/ Division	Packing group
UN1845	Dry ice	Carbon dioxide, solid (dry ice)	9	III
UN3158	Liquid nitrogen	Gas, Refrigerated liquid (liquid nitrogen)	2.2	N/A[5]
No code (not dangerous goods)	Ice pack	N/A	N/A	N/A

5 not applicable

6 See http://www.iata.org/NR/rdonlyres/D9C935A0-7382-4567-B6EB-55B53F757C52/0/Section3622009.pdf p3-4 for detailed list

Documentation

1) Dangerous Goods Declaration (DGD, or shipper's declaration)

DGD is required for UN2814 or UN2900 category shipments. The shipper, usually the sending laboratory, is requested to attach the DGD form to such shipments. The shipper must have been trained in specific dangerous goods transport requirements. DGD must include: the name of the shipper and the address, specification of the shipment with its "UN code" and "Proper shipping name", "class/division" of the contents (see Tables 1 and 2), other required information defined in the DGR, and be signed by the person responsible for the shipment. (the DGD form is available at: http://www.iata.org/NR/rdonlyres/5A231396-76AD-47D7-BD93-B9501B6D25BA/0/DGD_ColumnFormat_F.pdf).
When dry ice is used as a refrigerant for UN2814 or UN2900 samples, the details of the dry ice must be shown at the NATURE AND QUALITY OF DANGEROUS GOODS part of the DGD.
The DGD is not needed for UN3373 shipment as long as the package satisfies PI650 packing instructions.

2) Customs invoice (proforma invoice)

In most of the cases, a customs invoice prepared by the shipper is required for the sample to undergo customs clearance at the country of destination.

3) Import permit

If contacted prior to the shipment of the sample, the recipient laboratory should be able to give guidance and/or provide an import permit for the sample.

4) Export certificate (animal health certificate of the exporting country)

In some cases, an export certificate is required to import the sample into the country of destination. The recipient laboratory should be able to provide advice on any such requirement.

5) Sample details

A letter addressed to the recipient laboratory should accompany the parcel with as much of the epidemiological history about the samples as possible, including species and age, area/country of sampling, date of sampling, any clinical findings, method and temperature at which samples were stored, etc. If several samples are included, they should have clear and distinct identification numbers. Contact details of the person who was involved in the sampling should also be given to the recipient laboratory.

6) Air Waybill (**AWB**)

AWB is a receipt issued by an international carrier company of goods and is evidence of the contract of carriage. The shipper must ask for the AWB number and inform the recipient laboratory of the AWB number immediately.

Packing of shipment

All materials should be in leak-proof containers (e.g. plastic sample vial), These should then be placed in a leak-proof secondary container, and transported in an IATA-approved outer container. The required packing type differs by the UN code of the contents (see Table 1). The outer box must be correctly marked and labelled according to the DGR (See Annex 4b). A commercially available shipping box satisfying PI602 requirement can be used for UN3373 shipments. In such cases, the Class 6 (infectious substance) label printed on the outer box must be covered/masked (i.e., it must not be visible). When dry ice is used as a refrigerant for UN3373, the net quantity of dry ice must be shown on the outside of the package. If liquid nitrogen is used for cooling purpose, the plastic primary container and the secondary container, both must be capable of withstanding very low temperatures. For more information see:
http://www.iata.org/NR/rdonlyres/9C7E382B-2536-47CE-84B4-9A883ECFA040/0/Guidance_Doc62DGR_50.pdf

It is recommended to make **photocopies** of all the abovementioned documents (in sections 1 through 4 above), put them in a transparent plastic bag and attach it to the surface of the shipment package. This is useful practice to avoid delays due to any uncertainty about the contents of the shipment.

E) Actions prior to, and immediately after, the shipment

As soon as the transport details (shipping date, airline name, flight number) are identified (usually several days before the shipment) the shipper must inform the recipient laboratory in order for them to start the preparations for testing.

As soon as the Air Waybill number (AWB number) of the shipment becomes available (usually several hours before the actual shipment) the shipper must inform the recipient laboratory of the AWB number without delay. This AWB number is needed to receive the shipment, especially in the case of airfreight.

F) Contingency planning

- It is recommended to confirm where/how dry ice can be obtained in your country before the actual need arises.
- It is recommended to confirm where/how IATA-approved containers for sample shipment (PI602 and/or PI650) can be obtained in your country before the actual need arises. A list of suppliers is available at: http://www.iata.org/NR/rdonlyres/F8D69F0E-D202-4D3F-8F37-CD51BBEF945C/0/dgr47appendixF.pdf.
- It is recommended to find out which courier / airline operator can transport infectious substances from your country before the actual need arises. If AIRFREIGHT is used, it is strongly recommended to use a direct flight. This is because some airline operators and/or airports are not able to accept diagnostic samples due to lack of requisite training; and it is not easy for a shipper to confirm whether all the relevant personnel at the transit airport(s) or connecting flight(s) are trained in handling infectious substances. It is safer if the shipper can use an international courier company specialized in transporting infectious substances.

G) Further reading

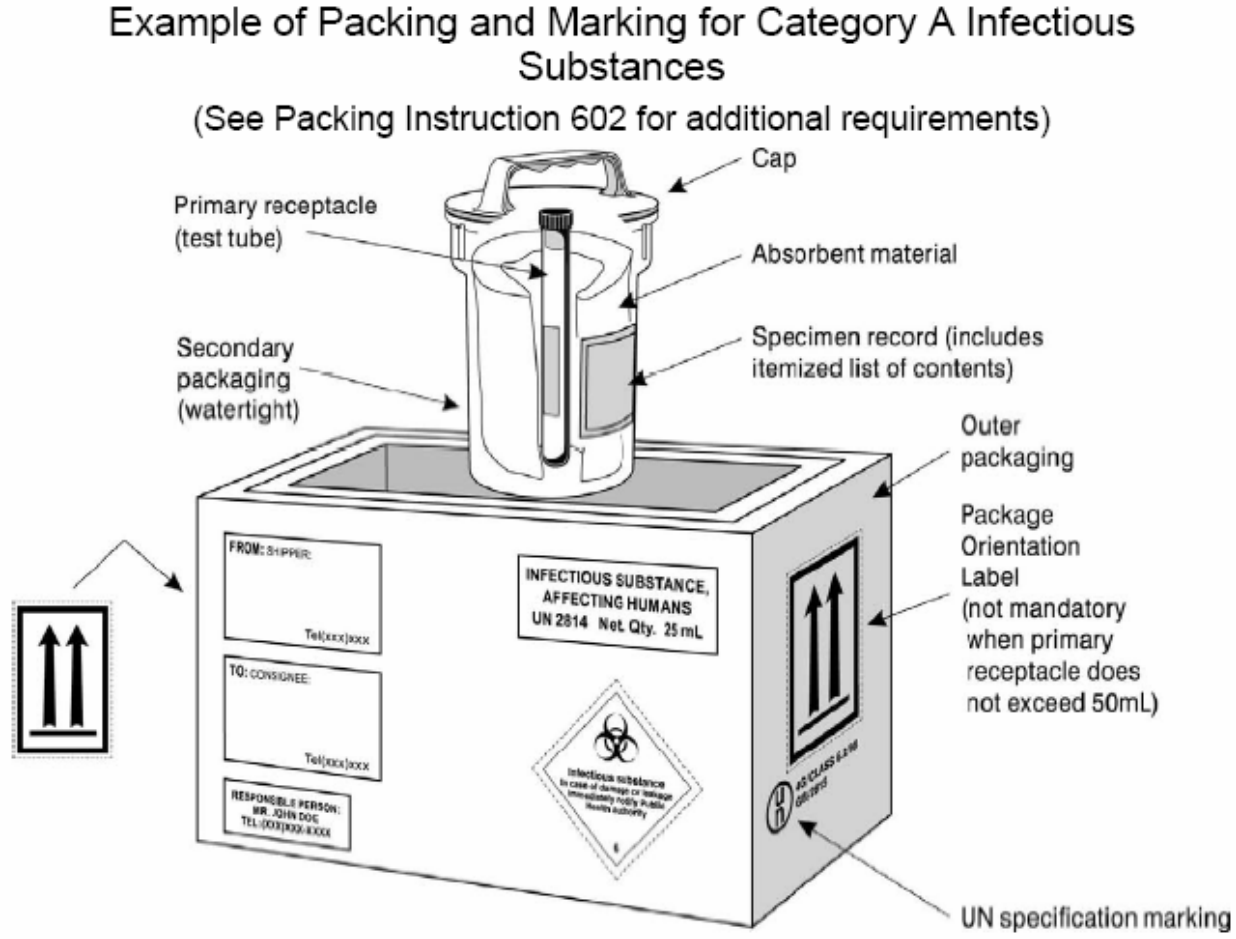
WHO
http://www.who.int/csr/resources/publications/biosafety/WHO_HSE_EPR_2008_10.pdf
http://www.who.int/ihr/infectious_substances/en/index.html
http://www.who.int/csr/resources/publications/swineflu/instructions-shipments/en/index.html

OIE
http://www.oie.int/eng/normes/mmanual/2008/pdf/1.1.01_COLLECTION.pdf (go to section D page 8)

IATA
http://www.iata.org/whatwedo/cargo/dangerous_goods/infectious_substances.htm

Annex 1. Examples of Packing and Marking for Category A and B Infectious Substances

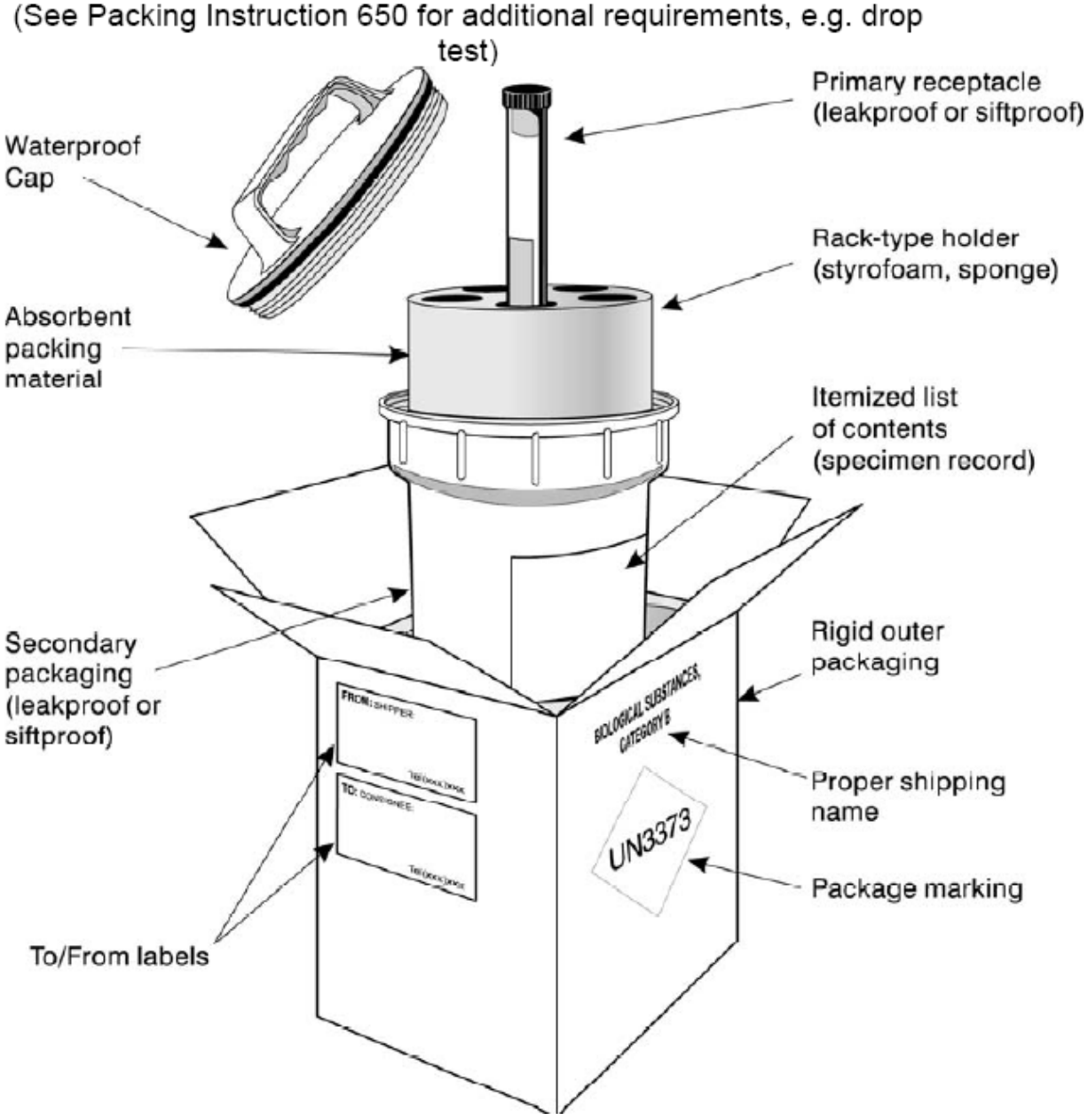
Source: http://www.iata.org/NR/rdonlyres/9C7E382B-2536-47CE-84B4-9A883ECFA040/0/Guidance_Doc62DGR_50.pdf



Notes:

1. The smallest external dimension of the outer packaging must not be less than 100 mm;
2. The primary receptacle or the secondary packaging must be capable of withstanding, without leakage, an internal pressure producing pressure differential of not less than 95 kPa.

Example of Packing and Marking for Category B Infectious Substances



Notes:

3. At least one surface of the outer packaging must have a minimum dimension of 100 mm x 100 mm;
4. The primary receptacle or the secondary packaging must be capable of withstanding, without leakage, an internal pressure producing pressure differential of not less than 95 kPa.