

Infectious Substance, Category A Shipping



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Introduction

Anyone packaging, handling, completing shipping documentation, shipping or transporting hazardous materials must be informed of the general requirements of handling hazardous materials as well as function specific training for the specific task(s) performed; this is accomplished through required training before performing any tasks associated with shipping hazardous materials and every three years thereafter. This guide reviews packaging requirements, markings and labels, and documentation and record keeping required for Biological Substances, Category B as well as exempt Human and Animal specimens. Dry Ice information is also provided. The majority of the emergency response and safe handling information is provided through the appropriate safety training offered by Environmental Health and Safety (EHS); for example Bloodborne Pathogens training provides emergency response and safe handling information for human specimens, and Laboratory Chemical Safety Training provides the same information for handling chemicals.

This guide is not a training document and is for use by trained individuals only. Training is available online at <http://www.yale.edu/ehs/hazmatship.htm>

All research materials shipments must be processed through Yale's Express Shipping tool, [eShip Global](#). If you have any question please contact EHS at 785-3550 or via email to ehshazmat@yale.edu.

Section 1: Dry Ice Shipping

Dry Ice is a hazardous material regulated by both the US Department of Transportation (DOT) and the International Air Transport Association (IATA). Dry Ice is classified as a Class 9, miscellaneous hazard, and is assigned UN 1845.

Three important safety factors to keep in mind when dealing with dry ice are: 1) it is a cryogen and its cold temperatures can cause frostbite and burns upon contact with unprotected skin; 2) it is a simple asphyxiant and can create a suffocation hazard by the displacement of oxygen; and 3) as it sublimates from a solid directly to a gas, the expansion of molecules can create a very pressurized state if placed within a sealed container. To mitigate these risks, please follow these simple safety guidelines when working with or using dry ice.

- Wear insulated gloves whenever handling dry ice; never handle dry ice with ungloved hands.
- Store dry ice in a well ventilated area; large quantities of dry ice in an unventilated room can create an oxygen deficiency, (i.e. hundreds of kilograms of dry ice in a large ice chest or a large dry ice chest in a small unventilated closet). Please contact EHS at 785-3550 to have the oxygen levels evaluated if you are storing very large quantities of dry ice.
- Never place dry ice inside a sealed transport container (i.e. leak proof secondary container). Dry ice must be placed within an outer shipping container or storage container that will allow venting or release of CO₂ gas to avoid pressurization. Sealing dry ice within a leak proof container can result in a bursting or exploding container, which can release its contents and/or create a serious physical hazard.

Packaging

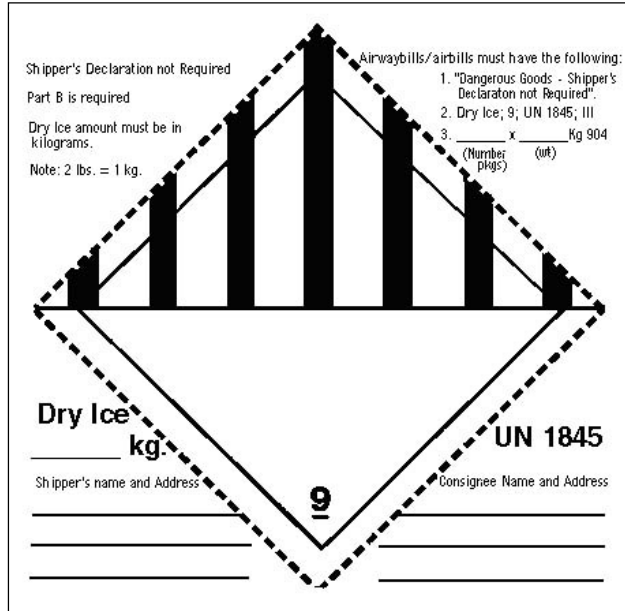
When shipping dry ice, use a vented container of sufficient strength to hold the amount of dry ice needed to preserve your shipment. Secure secondary containers to prevent them from moving as the dry ice sublimates. You may secure your samples within the outer box by making stabilizers out of cardboard or Styrofoam.

Labeling

Packages containing dry ice must bear the following information:

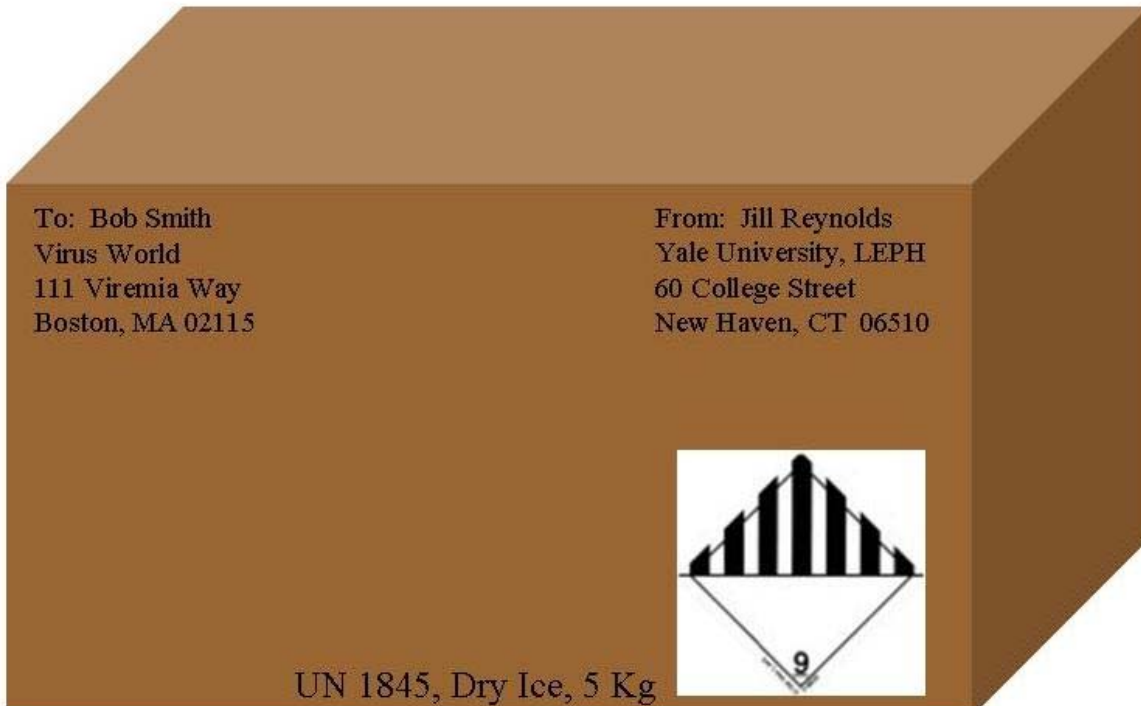
1. Name and address of the shipper and recipient. This is in addition to the information on the Air Waybill.
2. The text "Dry Ice, UN 1845"
3. The quantity of dry ice in kilograms (kg)

4. A Class 9 label. Example below:



Please note that the above labels must measure 100 mm (4") on each side of the diamond shape. A printable label will be provided by Yale's express shipping tool, eShip Global.

A properly labeled package of dry ice, containing no other regulated materials, is below:



Documentation:

The Air Waybill must be marked with the text “Dry Ice, UN 1845”, the number of packages, and the quantity of dry ice in kilograms (kg). This will be done by eShip Global based on the information provided when entering the shipment. An example of the completed air waybill is below:

From: Origin ID: EFBA (203)737-2125 Deborah Ferry Yale 135 College St New Haven, CT 06510	  <small>C 10 11002162124</small>	Ship Date: 16SEP10 Dry Ice: 4.0 KGS ActWgt: 12 LB Dims: 12 X 12 X 12 IN CAD: 6271659/WBUS0200
SHIP TO: (203)737-2139 BILL SENDER Kevin Charbonneau Yale University 135 College Suite 100 New Haven, CT 06510	Delivery Address Bar Code	
	 Ref # UN 1845, Dry Ice, 9, 1 X 4.5 Kg Invoice # PO # Dept #	<div style="border: 1px solid black; border-radius: 15px; padding: 5px; background-color: #e0f2f1;"> <p style="text-align: center; margin: 0;">Dry Ice, 9, UN1845, 1X4.5Kg</p> </div>
TRK# 7902 3404 5029 <small>0201</small>		FRI - 17SEP A4 PRIORITY OVERNIGHT ICE
00 EFBA		06510 CT-US BDL
		

There is a “Dry Ice Acceptance Checklist” in Appendix 4 that you can use to ensure proper packaging, labeling, and documentation of your dry ice shipment. A copy of this checklist will also be provided by eShip Global.

Section 2: Classification of Biological Materials

Infectious Substances are materials that are known to or reasonably expected to contain a pathogen. Current regulations apply a ranking scheme to infectious substances based on the probability of causing harm to a person or animal. The ranking scheme is as follows:

Category & UN #	Potential for Harm	Examples
A UN 2814 (human pathogens) UN 2900 (animal pathogens)	High	Human or animal pathogens that are cultured or amplified, such as cultures, stocks, or slants of infectious materials or genetically modified organisms or microorganisms meeting the definition of an infectious substance (e.g. recombinant VSV lab strains). Also included are diagnostic or clinical specimens containing a Risk Group 4 agent or a Select Agent. See Appendix 2 for a complete list of these high risk agents.
B UN 3373	Moderate	Biological substances, such as diagnostic or clinical specimens from humans or animals that are known to harbor a pathogen or have a high probability of containing a pathogen. Genetically Modified Organisms or Microorganisms that are “defective” but can still “alter a cell” (e.g. defective pathogen vectors, such as adenovirus, herpesvirus, retrovirus, AAV, etc.) Biological substances containing or having a high probability of containing a Risk Group 4 agent or a Select Agent cannot be shipped as a Category B infectious substance.
Exempt Human or Animal Specimen No UN#	Low	Biological substances that are not known to harbor a pathogen or that have lower probability of containing a pathogen. Most of the general human and animal specimens in research and diagnostic facilities will fall in this category.

Infectious Substance, Category A

An infectious substance in a form capable of causing permanent disability or life-threatening or fatal disease in otherwise healthy humans or animals when exposure to it occurs. Category A Infectious Substances are assigned the identification number UN 2814 (human pathogens, zoonoses, and prions) or UN 2900 (animal pathogens).

Example: *You wish to ship a vial of HIV culture from a Yale research lab to a collaborating lab in Maryland.*

Ship as: Category A Infectious Substance, Class 6.2 Infectious Agent

Technical Shipping name: UN 2814, Infectious Substance, Affecting Humans (Human Immunodeficiency Virus)

Rationale: This material is amplified and is a known infectious material.

Biological Substance, Category B

An infectious substance that is not in a form generally capable of causing permanent disability of life-threatening or fatal disease in otherwise healthy humans or animals when exposure to it occurs. Category B Infectious Substances are assigned the identification number UN 3373.

Example: *You have been asked to ship serum specimens from a research protocol that is involved in determining the prevalence of HIV and other bloodborne pathogens among IV drug users. To date, preliminary data show that roughly 45% of those sampled are positive for one of the 3 major bloodborne pathogens (HIV, HBV, or HCV).*

Ship as: Biological Substance, Category B

Technical shipping name: UN 3373, Biological Substance, Category B

Rationale: You either know that these items are infected or have a very high probability of containing a human pathogen. However, as the samples are of clinical/diagnostic origin, they are not cultured or amplified. Therefore you may ship as a biological substance.

Exempt Human or Animal Specimen – human or animal sample (including, but not limited to, secreta, excreta, blood and its components, tissue and tissue fluids, and body parts) being transported for routine testing not related to the diagnosis of an infectious disease, such as for drug/alcohol testing, cholesterol testing, blood glucose level testing, prostate specific antibody testing, testing to monitor kidney or liver function, pregnancy testing, or for tests for diagnosis of non-infectious diseases, such as cancer biopsies, and for which there is low probability the sample is infectious.

Example: *You are conducting a research project investigating the role of elevated cholesterol in heart disease. You are required to ship samples collected in the field here in CT to a testing lab in Indiana for analysis. You will be collecting 10 ml of blood from each test subject.*

Ship as: Exempt Human Specimen

Technical shipping name: Exempt Human Specimen

Rationale: You are not shipping known infectious materials and although the material is of human origin, you also don't have any reason to regard these as having a higher than normal probability of containing an infectious agent. The only way this classification would change is if your study had background pathogen test results on the patient. If you knew that a particular patient had HIV, HBV or some other pathogen, you would be required to ship this as an infectious substance, either Category B or Category A as appropriate.

Non-Regulated Materials

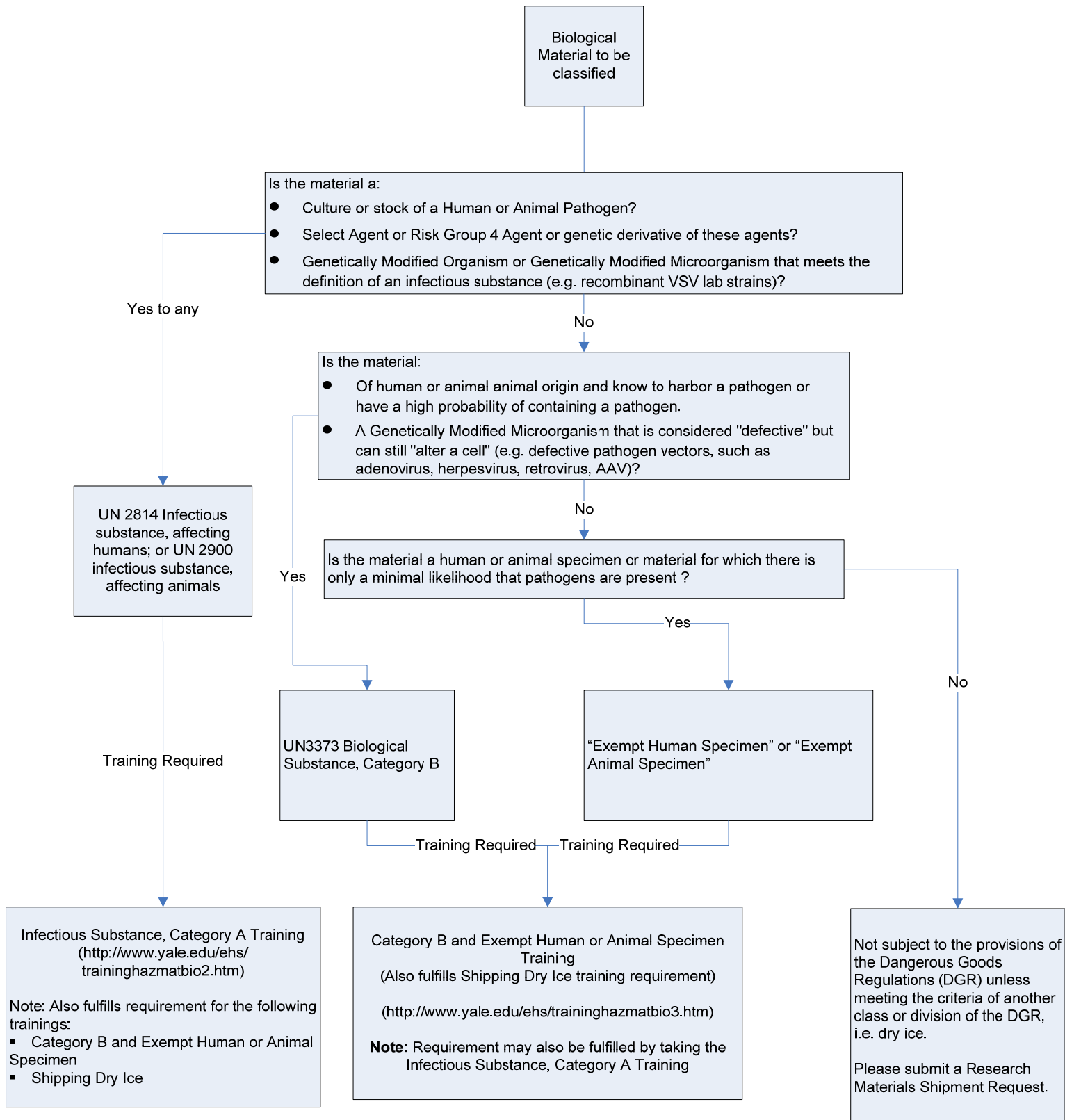
Examples of materials that are not regulated, as specified by the U.S. DOT and IATA:

- A material that does not contain an infectious substance or that is unlikely to cause disease in humans or animals.
- Non-infectious biological materials from humans, animals, or plants. Examples include DNA, RNA or other non-infectious genetic elements. However, genetic elements associated with the pathogenicity, toxicity, or other harmful sequences of some infectious substances may require an export license.
- A material containing microorganisms that are non-pathogenic to humans or animals.
- A material containing pathogens that have been neutralized or inactivated.
- A biological product subject to Federal approval, permit, review or licensing requirements such as those required by the USDA, FDA, or DHHS.
- Blood collected for the purpose of transfusions or preparation of blood products; blood products; plasma; plasma derivatives; blood components; tissues or organs intended for use in transplant

operations; and human cell, tissues, and cellular and tissue-based products regulated under the FDA or other national authority.

- Dried blood spots or specimens for fecal occult blood detection placed on absorbent filter paper or other material.

Classification Flow Chart



Section 3: Exempt Human or Animal Specimen Shipping

Packaging

There are no test specifications for Exempt Human (or Animal) Specimen packaging. This indicates that the shipper can assemble their own materials for shipment rather than purchase a complete shipper. However, EHS recommends that the complete packaging created for an Exempt shipment is able to pass a basic 4 foot drop test performed by the Shipper on a prototype package. For example, if the sealed Exempt Human Specimen package were to be dropped from shoulder height to a solid floor, the primary container would not break or leak. The following are the requirements for this packaging:

1. A leak proof primary container, with sufficient cushioning and absorbent material to surround each primary container that contains liquid.
2. A leak proof secondary container to house the primary containers with enough absorbent inside this container to absorb the entire liquid contents of the package if all were released. Sealed 50 ml conical plastic tubes, sealed plastic bags and other sealed plastic containers are examples of suitable containers that are probably present within your research or diagnostic clinical laboratory. **The secondary container cannot serve as the outer shipping container for these specimens.**
3. The secondary container must fit snugly inside the outer rigid shipping container to prevent excessive movement during shipment, which could damage the primary containers.
4. The outer rigid shipping container can be a fiberboard or plastic box.

Labeling

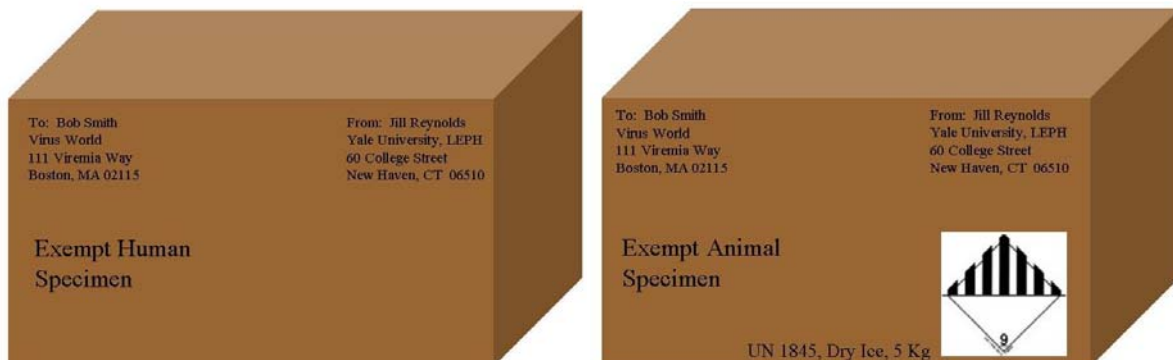
- Name and address of the shipper and recipient. This is in addition to the information on the air waybill.
- The universal biohazard symbol must be placed on the outside of the secondary container. This can be done by affixing an orange biohazard sticker to the secondary container, or by using a bag that is pre-labeled with the universal biohazard symbol.
- The outside of the shipping container must be labeled with an “EXEMPT HUMAN SPECIMEN” or an “EXEMPT ANIMAL SPECIMEN” label. A printable label will be provided by Yale’s express shipping tool, eShip Global. Examples of exempt specimen labels are below.

Exempt Human
Specimen

Exempt Animal
Specimen

- If shipping on dry ice, all the labeling requirements for dry ice outlined in Section 1 must be met.

Examples of properly labeled exempt specimen packages, with and without dry ice are below:



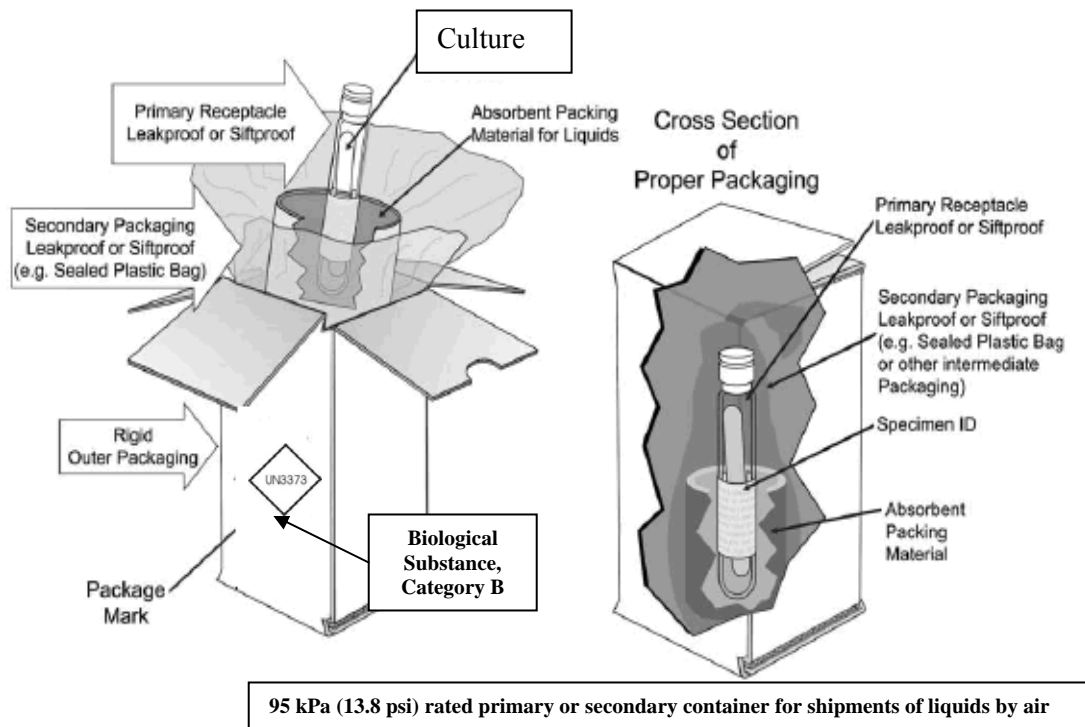
Documentation:

There are no documentation requirements for exempt human or animal specimens; no information must be entered on the air waybill. However, if the shipment includes dry ice you must document the dry ice as indicated in Section 1.

Section 4: Biological Substance, Category B Shipping

Packaging

The figure below shows the generalized "triple" packaging (leak proof primary receptacle, leak proof secondary packaging, and durable outer packaging) required for shipping Biological Substance, Category B material. The entire package must be capable of passing a series of 4' drop tests as specified by U.S. DOT and IATA; documentation is required. Approved packaging is available in the Stockrooms, through SciQuest or from the vendors listed in Appendix 3.



Specifications of Biological Substance, Category B Packaging:

1. Leak proof primary container
2. Absorbent material placed between the primary receptacle and secondary packaging (enough absorbent to absorb the entire contents of the primary receptacles)
3. Cushioning in between primary receptacles.
4. For air shipments: primary receptacles may not exceed 1 L and each package may not exceed 4 L.
5. For shipments of liquid by air, the primary or secondary container must be capable of withstanding a pressure of 95 kPa (13.8 psi) and temperatures between (-40 F to 130 F). **Please note that plastic bags can be used as secondary containers for liquids, but they must be of sufficient strength and tested to pass the 95 kPa pressure test.**
6. Secondary packaging secured in rigid outer packaging (at least 4 inches in width).
7. A list of contents in between the secondary and outer rigid shipping container.

Labeling

1. Name and address of shipper and recipient, this is in addition to the information on the air waybill.
2. Name and phone number of a “Responsible Person” must be placed on the outer container. This person is available during normal business hours (8:30 AM – 5:00 PM) to answer questions about the package. If this person is the shipper, add the phone number to the name and address information.
3. Outer packaging must include the UN 3373 label. An example is below:



Please note that this label should be 100 mm (4”) on each side of the diamond shape. Unlike most other hazard labels, UN3373 labels are allowed to be as small as 2” on each side of the diamond shape. A printable label will be provided by Yale’s express shipping tool, eShip Global.

4. The technical name for the shipment: “Biological Substance, Category B”.
5. Orientation arrows on either side of the package must be utilized if the net quantity of liquid Category B, Biological Substance material is > 50 ml.
6. If shipping on dry ice all the labeling requirements for dry ice outlined in Section 1 must be met.

Examples of properly labeled Biological Substance, Category B material with or without dry ice are below:



Documentation

Biological substance, category B material must be identified on the airway bill. This is done by placing the text “UN3373 Biological Substance, Category B” and the number of packages in the nature and quantity of goods section of the airway bill. This will be done by eShip Global based on the information provided when entering the shipment. If dry ice is used, the appropriate information will also be entered automatically. An example of the completed air waybill is below:

From: Origin ID: EFBA (203)737-2125 Deborah Ferry Yale 135 College St New Haven, CT 06510	 <small>C 10 111002162124</small>	Ship Date: 16SEP10 ActWgt: 4 LB CAD: 6271659/WBUS0200
SHIP TO: (203)737-2139 BILL SENDER Kevin Charbonneau Yale University 135 College Suite 100 New Haven, CT 06510	Delivery Address Bar Code  Ref # Biological Substance, Invoice # Category B, UN3373, 1 PO # Dept #	
	TRK# 0201 7903 5808 7908	FRI - 17SEP A4 PRIORITY OVERNIGHT
00 EFBA		06510 CT-US BDL
		

There is a “Biological Substance, Category B Acceptance Checklist” in Appendix 5 that you can use to verify proper packaging, labeling, and documentation of your shipment. If shipping on dry ice please also use the “Dry Ice Acceptance Checklist” in Appendix 4. A copy of this checklist will also be provided by eShip Global.

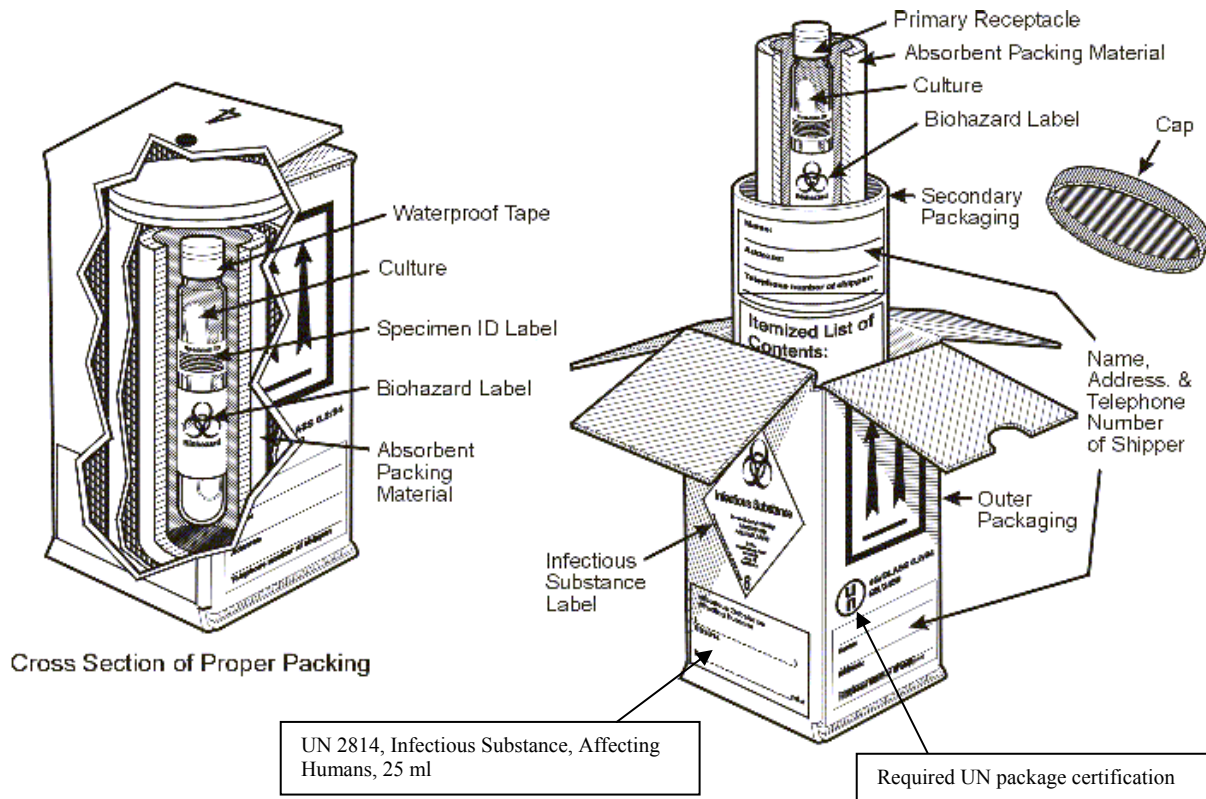
Section 5: Infectious Substance, Category A Shipping

Packaging

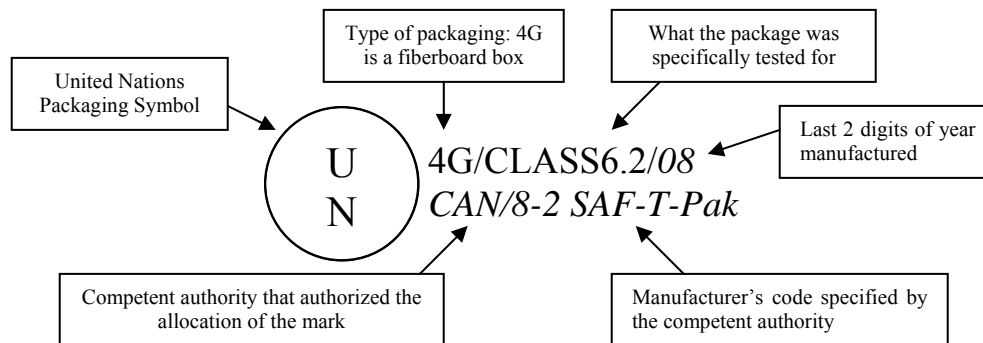
The figure below shows the generalized "triple" packaging (primary receptacle, watertight secondary packaging, and durable outer packaging) required for shipping Infectious Substance, Category A material. This packaging must be certified to meet rigorous performance tests as outlined in the DOT, USPS, PHS, and IATA regulations. Only use UN certified packaging for the shipment of these materials. Please note that packaging is tested and approved for single use only. Packaging requirements are as follows:

1. A watertight primary receptacle.
2. A watertight secondary packaging. If multiple fragile primary receptacles are placed in a single secondary packaging, they must be either wrapped individually or separated to prevent contact between them.
3. A rigid outer packaging (minimum size of 4”) of adequate strength for its capacity, mass and intended use.
4. For a liquid infectious substance, an absorbent material placed between the primary receptacle and the secondary packaging. The absorbent material must be sufficient to absorb the entire contents of all primary receptacles.
5. An itemized list of contents enclosed between the secondary packaging and the outer packaging.
6. The primary receptacle or secondary packaging used for infectious substances must be capable of withstanding, without leakage, an internal pressure producing a pressure differential of not less than 95 kPa (0.95 bar, 14 psi).

7. The primary receptacle or secondary packaging used for infectious substances must be capable of withstanding, without leakage, temperatures in the range of $-40\text{ }^{\circ}\text{C}$ to $+55\text{ }^{\circ}\text{C}$ ($-40\text{ }^{\circ}\text{F}$ to $+130\text{ }^{\circ}\text{F}$).



Certified packaging will bear a United Nations (UN) mark similar to the following:



Labeling

1. Name and address of shipper and recipient, this is in addition to the information on the air waybill.
2. Name and phone number of a "Responsible Person" must be placed on the outer container. This person is available during normal business hours (8:30 AM – 5:00 PM) to answer questions about the package. If this person is the shipper, add the phone number to the name and address information.
3. The UN number, proper shipping name of the material, and quantity of material:
 - a. UN 2814, Infectious substance, affecting humans <quantity of material>
 - b. UN 2900, Infectious substance, affecting animals <quantity of material>
4. The Class 6.2 infectious substance label shown below.



Please note that this label should be 100 mm (4”) on each side of the diamond shape.

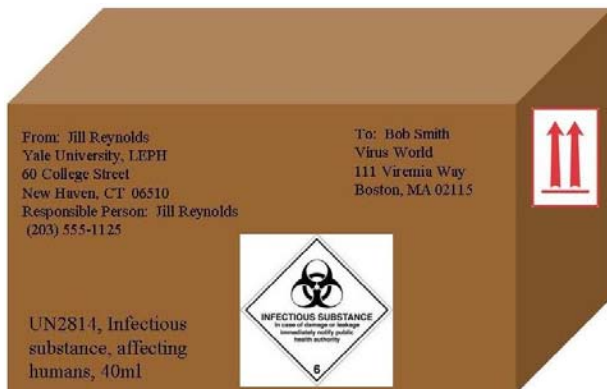
5. Orientation arrows on either side of the package must be utilized if the net quantity of liquid Infectious Substance, Category A material is > 50 ml.
6. If the total net quantity of infectious materials exceeds 50 ml or 50 gm, the orange Cargo Aircraft Only shipping label shown below must be affixed to the package.



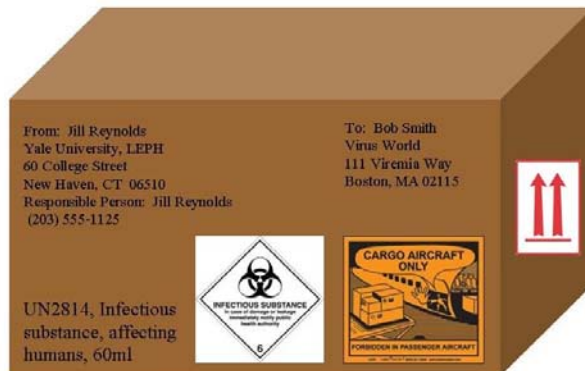
A printable label is available in Appendix 3.

7. If shipping on dry ice all the labeling requirements for dry ice outlined in Section 1 must be met.

Examples of properly labeled Infectious Substance, Category A packages are below:



Infectious Substance, Category A \leq 50 ml



Infectious Substance, Category A > 50 ml

Documentation

When shipping Infectious Substance, Category A materials, including genetically modified microorganisms that meet the definition of an infectious substance, a Shipper’s Declaration of Dangerous Goods (Shipper’s Declaration) is required. The Shipper’s Declaration is a legal document completed and signed by the trained shipper. There must be no spelling errors and the Shipper’s Declaration must be completed in one person’s

hand writing using the same pen, or typed. If shipping via FedEx, be aware that FedEx requires Shipper's Declarations to be typed. There are three items on the Shipper's Declaration that may be completed or modified by the carrier: the Air Waybill Number, Airport of Departure and Airport of Destination.

A completed Shipper's Declaration will be provided by eShip Global. Please note that a color printer is required since the hash marks on the sides of the Shipper's Declaration must be in red.

Completing the Shipper's Declaration

Shipper:

Enter the full name, address, and phone number of the shipper.

Consignee (Recipient):

Enter the full name, address, and phone number of the consignee (recipient).

Airway Bill Number:

Enter the appropriate airway bill number. This information may be entered or amended by the accepting operator.

Page_of_Pages

Enter the appropriate page number and the total number of pages of the Shipper's Declaration.

Type of Aircraft (Quantity Limit):

Delete the box that does not apply by striking it out. Quantities > 50 ml or > 50 g of an Infectious Substance, Category A material will require shipment on Cargo Aircraft Only. Quantities below these limits are allowed in the cargo sections of passenger aircraft.

Airport of Departure:

Enter the full name of the airport or city of departure. This information may be entered or amended by the carrier.

Airport of Destination:

Enter the full name of the airport or city of destination. This information may be entered or amended by the carrier.

Shipment Type:

Delete the box that does not apply by striking it out. Invariably, the word Radioactive will be deleted (marked out) as this guide deals with the regulatory transport of infectious substances.

Nature and Quantity of Dangerous Goods:

The correct completion of this section is the most important part of the Shipper's Declaration.

a. Dangerous Goods Identification:

- i. UN or ID Number
- ii. Proper Shipping Name: Enter the proper shipping name followed by the technical name in brackets. For example: Infectious Substance, affecting humans (Hepatitis B virus)
- iii. Class or Division
- iv. Packing Group
- v. Subsidiary Risk: There are no subsidiary risks for any of the materials listed below.

See the table below for the appropriate information.

UN Number	Shipping Name	Class	Packing Group
UN2814	Infectious Substance, affecting humans (<i>technical name</i>)	6.2	None, leave blank
UN2900	Infectious Substance, affecting animals (<i>technical name</i>)	6.2	None, leave blank
UN1845	Dry ice	9	III

b. Quantity and Type of Packing:

Enter the total quantity of each dangerous good and the type of material the outer box is made from. For example, 20 ml total in four 5 ml tubes and 10 kg of Dry Ice, all packed in one fiberboard box).

c. Packing Instruction:

Enter the packing instruction from the list below:

Shipping Name	Packing Instruction for Passenger Aircraft Quantities	Packing Instruction for Cargo Aircraft Quantity
Infectious Substance, affecting humans (<i>technical name</i>)	620	620
Infectious Substance, affecting animals (<i>technical name</i>)	620	620
Dry ice	954	954

d. Authorization:

Leave Blank

Additional Information:

Enter the following:

- a. The **name and phone number of a responsible person.** The responsible person has knowledge of the materials shipped and has provided their phone number on the Shipper’s Declaration form for acceptance of questions during normal business hours (8:30 AM to 5:00 PM). This is not a replacement of the required 24-hour emergency response number required in the lower half of the form.
- b. An emergency phone number that is manned 24 hours a day by a person knowledgeable about the emergency response requirements for the material being shipped. Yale University has contracted CHEMTREC to serve as an initial contact to provide emergency response information.

24-hour emergency numbers for use on Shipper’s Declaration:

Shipments within USA - 800-424-9300

International shipments - 703-527-3887

c. Certification

The Shipper’s Declaration Form must contain the following certification statement in the lower section of the form:

“I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable International and National Governmental Regulations. I declare that all of the applicable transport regulations have been met.” Most Shipping Declaration forms will contain this statement pre-printed on the form.

d. Name/Title of Signatory

The name and job title of the individual who completed the Shipper’s Declaration form.

e. Place and Date:

Enter the place and date of signing

f. Signature:

Only the trained person who actually packaged the container being offered for shipment can sign the Shipper’s Declaration. The name of the official “Shipper” in the top left hand corner of the Shipper’s Declaration Form may be a different person than the “packager,” (i.e. the Shipper can be the Laboratory Director or the Principal Investigator). The person completing the Shipper’s Declaration form must have also packaged the hazardous materials.

The Shipper's Declaration form must be **maintained for 2 years** by the shipper. In addition, a copy must be sent to EHS for record keeping.

An example of a completed Shipper's Declaration is on the next page.

There is an "Infectious Substance, Category A Acceptance Checklist" in Appendix 6 that you can use to verify proper packaging, labeling, and documentation of your shipment. If shipping on dry ice please also use the "Dry Ice Acceptance Checklist" in Appendix 4. Copies of these checklists will be provided by eShip Global as needed.

SHIPPER'S DECLARATION FOR DANGEROUS GOODS

(Provide at least three copies to the airline.)

Shipper

Air Waybill No.
 Page of Pages
 Shipper's Reference Number
(optional)

Consignee



Two completed and signed copies of this Declaration must be handed to the operator

WARNING

Failure to comply with all respects with the applicable Dangerous Goods Regulations may be in breach of the applicable law, subject to legal penalties.

TRANSPORT DETAILS

This shipment is within the limitations prescribed for:
(delete non applicable)

Airport of Departure

PASSENGER AND CARGO AIRCRAFT	CARGO AIRCRAFT ONLY
------------------------------	---------------------

Airport of Destination:

Shipment type: *(delete non-applicable)*
 NON-RADIOACTIVE RADIOACTIVE

NATURE AND QUANTITY OF DANGEROUS GOODS

Dangerous Goods Identification				Quantity and type of packaging	Packing Inst.	Authorization
UN or ID No.	Proper Shipping Name	Class or Division (Subsidiary Risk)	Pack-ing Group			

Additional Handling Information

I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labelled/placarded, and are in all respects in proper condition for transport according to applicable International and National Governmental Regulations. I declare that all of the applicable air transport requirements have been met.

Name/Title of Signatory
 Place and Date
 Signature *[A typed signature may be used if the origin and destination are in the United States or its territories.]*
(see warning above)

Emergency Telephone Number

FOR RADIOACTIVE MATERIAL SHIPMENT ACCEPTABLE FOR PASSENGER AIRCRAFT, THE SHIPMENT CONTAINS RADIOACTIVE MATERIAL INTENDED FOR USE IN OR INCIDENT TO RESEARCH, MEDICAL DIAGNOSIS, OR TREATMENT. ADR EUROPEAN TRANSPORT STATEMENT: CARRIAGE IN ACCORDANCE WITH 1.1.4.2.1

Section 6: Security

The shipper will follow the security awareness protective measures listed below when shipping an Infectious Substance, Category A material:

- Restrict access to your laboratory to authorized personnel only.
- Avoid discussing the nature of your research with those you are not familiar with.
- Report suspicious activity*, events, and people to Yale Police (432-4400) or Yale Security at (785-5555). This would include lost or damaged packages.
 - An unauthorized person asking for access to, or loitering near, a laboratory or other area where hazardous shipments are prepared and/or stored prior to pick-up. This could include a vehicle into which materials will be loaded.
 - An unauthorized person interfering with the packaging, loading or transportation of hazardous materials.
 - An unauthorized person taking photographs of a hazardous shipping facility, vehicle, or package.
 - An unauthorized person asking questions about the contents of a hazmat shipment, the function of hazmat shipping employees, or about other activities of a hazardous materials shipping facility or vehicle.
 - An unauthorized person following a hazmat employee, shipper, carrier, or vehicle.
- Keep packages of hazardous materials in a secure location or under direct guidance of laboratory staff at all times.
- Select a courier that will keep the package secure during transport and can track the package at all points from pick-up through delivery.
- Verify the chain of custody and security by having the package recipient notify your laboratory once it has been received in good condition.

In the event of a security breach (stolen/lost package, unauthorized person interfering with package preparation, etc.) take the appropriate action of calling Campus Police (432-4400) or Campus Security (785-5555).

Section 7: Dry Nitrogen Shippers

Dry nitrogen shippers, which maintain the temperature of liquid nitrogen after being charged with liquid nitrogen then emptied before shipment, do not qualify as hazardous materials and are not subject to the shipping regulations if they don't contain hazardous materials. Researchers are encouraged to pursue the use of dry shippers to reduce their regulatory burden where possible. The liquid nitrogen must be fully absorbed within the container in a porous material, the container must not allow the build-up of pressure, and won't allow the release of liquid nitrogen in any orientation. If a dry-nitrogen shipper is purchased, follow the manufacturer's written instructions for its use and double check that there is no free liquid nitrogen inside the container prior to shipment.

If shipping a dry nitrogen shipper via FedEx, the shipper must be labeled with the following:

- "Dry Dewar", and
- "Not Restricted"

Section 8: International Shipments

When shipping research materials internationally, additional documentation is required. EHS is aware of the following additional documentation requirements.

- Commercial Invoice
- FedEx Declaration of Biological Shipments
- Destination Control Statement

The forms will be provided by eShip Global based on the information provided when entering the shipment.



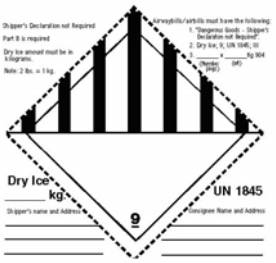
Section 9: Materials of Trade Exemption

Category B Infectious Substances and Exempt Human/Animal Specimens transported from one Yale “owned” location to another Yale “owned” location may be transported under a Material of Trade Exemption if:

- Transport is by a private motor carrier in direct support of a principle business that is other than transportation by motor vehicle [i.e. research]
- A combination packaging is used as outlined in this training
- If one or more inner packagings are used, the inner packagings may not contain more than 0.5 Kg (1.1 lbs) or 0.5 L (17 ounces) and the outer package must contain not more than 4 Kg (8.8 Lbs) or 4 L (1 gallon)
- If a single inner packaging is used it may not contain more than 16 Kg (35.2 Lbs) or 16 L (4.2 gallons) in a single outer packaging
- The driver must be informed of the presence of hazardous material and must be informed of the requirements of the Materials of Trade exemption

Appendix 1 Biological Materials Shipping Regulations – Quick Comparison Chart

	Infectious Substance, Category A	Biological Substance, Category B	Exempt Human or Animal Specimen	Dry Ice
UN #	UN2814 or UN2900	UN3373	None	1845
UN Approved Packaging	YES	NO	NO	NO
Packaging Performance Tests	Must use UN certified packaging that passed the tests specified in the IATA Dangerous Goods Regulations	Triple packaging must pass a 1.8 meter or 4 foot drop test. Packages shipped by air must meet a 95 kPa or 14 psi pressure test of primary or secondary container.	None Triple packaging (leak proof primary, leak proof secondary, and sturdy outer container)	None Must be of adequate strength for intended use and allow gas to dissipate
Name of Shipper and Consignee on Package and Air Waybill	YES	YES	YES	YES
Name and Phone Number of Responsible Person on Package	YES	YES	YES	YES
Marking on Package	UN2814, Infectious substance, affecting humans Or UN2900, Infectious substance, affecting animals	UN 3373, Biological Substance, Category B	Exempt Human Specimen Or Exempt Animal Specimen	UN 1845, Dry Ice

<p>Label Required</p>			<table border="1" style="width: 100%;"> <tr> <td style="width: 50%;">Exempt Specimen</td> <td style="width: 50%;">Human</td> </tr> <tr> <td>Exempt Specimen</td> <td>Animal</td> </tr> </table>	Exempt Specimen	Human	Exempt Specimen	Animal	
Exempt Specimen	Human							
Exempt Specimen	Animal							
<p>Shipper's Declaration of Dangerous Goods Required</p>	<p>YES</p>	<p>NO, but: "UN3373 Biological Substance, Category B" must be on the airway bill or Accuship label</p>	<p>NO</p>	<p>NO</p>				

Appendix 2 Printable Cargo Aircraft Only Label

The label below should print with the proper dimensions of a Cargo Aircraft Only label (minimum dimensions: 120 X 100 mm). Cut around the outside border of the label and affix it a vertical side of the box (not the top or bottom), oriented as shown below. Many printer inks run when exposed to even small amounts of water, such as rain or snow, therefore, when using this label, cover with clear plastic tape once applied to package.



Appendix 3 Vendors for Shipping Packaging and Labels

Appropriate packaging may be ordered through SciQuest. There is a folder called “Research Materials Shipping Supplies in the “Favorites” section. This list is not all-inclusive; there are other vendors for UN approved and diagnostic packaging. Shipping labels and declaration forms can also be purchased through any of these vendors. Please be sure to order the appropriate packaging if shipping on dry ice.

<p>Air Sea Atlanta 1234 Logan Circle Atlanta, GA 30318 Ph: 404-351-8600 Fax: 404-364-4005 Website: http://www.airseatlanta.com</p>	<p>Air Sea Containers, Inc. 2749 NW 82nd Avenue Miami, FL 33122 Ph: 888-272-9883 Fax: 305-599-1668 Website: http://www.airseacontainers.com</p>
<p>All-Pak, Inc. Corporate One West 1195 Washington Pike Bridgeville, PA 15017-2854 Ph: 1-800-245-2283 Fax: 412-257-3001 Website: http://www.all-pak.com</p>	<p>CARGOpak Corporation 3215-A Wellington Court Raleigh, NC 27587 Ph: 919-878-9933 / 1-800-266-0652 Fax: 919-554-9055 Website: http://www.cargopak.com</p>
<p>DG Supplies, Inc. 4 Corporate Drive Suite D, Bldg. 4 Cranbury, NJ 08512 Toll Free: 800.347.7879 Fax: 609.860.0096 E-mail: sales@DGSupplies.com Website: http://www.dgsupplies.com</p>	<p>Inmark, Inc. 675 Hartman Road - Suite 100 Austell, GA 30168 Ph: 770-373-3300 / 1-800-646-6275 (outside Georgia) Fax: 770-373-3301 Website: http://www.inmarkinc.com</p>
<p>SCA ThermoSafe (formerly Polyfoam Packers Corp.) 2320 Foster Ave Wheeling, IL 60090-6572 Ph: 847-398-0110 / 1-800-323-7442 Fax: 847-398-0653 Website: http://www.thermosafe.com</p>	<p>Saf-T-Pak, Inc. 101 17972 – 106 Avenue Edmonton, Alberta, Canada T5S 1V4 Mark J. Caputo District Manager Northeast Tel 617-539-0950 Fax 617-539-0940 MarkCaputo@saftpak.com Website: http://www.saftpak.com</p>

Note: Some of the suppliers listed above also provide shipping labels and primary receptacle containers as separate products. Contact the specific vendor to see if they offer the desired products.

Appendix 4 Dry Ice Acceptance Checklist

The example checklist is provided to assist trained shippers in verifying that a package of dry ice when packaged on its own, or with non-dangerous goods, is in compliance with shipping regulations.

Is the following information correct for each entry? **YES NO N/A**

Documentation

The Accuship label or Air Waybill contains the following information:

- | | | | |
|--|--------------------------|--------------------------|--------------------------|
| 1. The UN Number "1845", preceded by the prefix "UN" | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. The words "Carbon dioxide, solid" or "Dry ice" | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. The Class number "9" | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. The number of packages of dry ice..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. The net quantity of dry ice in kilograms | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Quantity

- | | | | |
|---|--------------------------|--------------------------|--------------------------|
| 6. The quantity of dry ice per package is 200 kg or less..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|---|--------------------------|--------------------------|--------------------------|

Package Condition

- | | | | |
|--|--------------------------|--------------------------|--------------------------|
| 7. Packages are free from damage and in a proper condition for carriage | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. The packaging is vented to permit the release of gas and is of sufficient strength for the amount of material being shipped | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Markings

- | | | | |
|--|--------------------------|--------------------------|--------------------------|
| 9. The words "Carbon dioxide, solid" or "Dry ice" | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. The UN number "1845" preceded by prefix "UN" | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 11. Full name and address of the shipper and consignee | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 12. The net quantity of dry ice within each package | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Labels

- | | | | |
|--|--------------------------|--------------------------|--------------------------|
| 13. Class 9 label affixed | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 14. Irrelevant marks and labels removed..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

***IF ANY BOX IS CHECKED "NO", DO NOT SEND THE SHIPMENT. CORRECT ISSUE.**

Appendix 5 Biological Substance, Category B Acceptance Checklist

The following checklist is provided to assist trained shippers in verifying that a package of Biological Substance, Category B material is in compliance with shipping regulations.

Is the following information correct for each entry? **YES NO N/A**

Documentation

The Accuship label or Air Waybill contains the following information:

- | | | | |
|---|--------------------------|--------------------------|--------------------------|
| 1. The text "UN3373 Biological Substance, Category B" | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.. The number of packages | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Quantity

- | | | | |
|--|--------------------------|--------------------------|--------------------------|
| 3.. The quantity of Biological Substance, Category B per primary container is
1 liter or less for liquids and 4 kilograms or less for solids..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. The quantity of Biological Substance, Category B per outer packaging is
4 liters or less for liquids and 4 kilograms or less for solids..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Package Condition

- | | | | |
|--|--------------------------|--------------------------|--------------------------|
| 1. Packages are free from damage and in a proper condition for carriage | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. For liquids shipped by air the primary or secondary container is capable
of withstanding a pressure differential of 95 kPa | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. The completed package is documented to pass a series of 4 foot drop tests as
indicated by the DOT/IATA | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Markings

- | | | | |
|--|--------------------------|--------------------------|--------------------------|
| 4. The words "UN3373 Biological Substance, Category B" | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Full name and address of the shipper and consignee | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Labels

- | | | | |
|--|--------------------------|--------------------------|--------------------------|
| 6. UN3373 label affixed | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Irrelevant marks and labels removed | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

*IF ANY BOX IS CHECKED "NO", DO NOT SEND THE SHIPMENT. CORRECT ISSUE.

Appendix 6 Infectious Substance, Category A Acceptance Checklist

Infectious Substance, Category A Checklist

Is the following information correct for each entry?

SHIPPERS DECLARATION FOR DANGEROUS GOODS (DGD)

YES NO* N/A

- 1. Two copies in English and in the IATA format (Three copies for FedEx) YES NO* N/A
- 2. Full name and address of Shipper and Consignee YES NO* N/A
- 3. If the Air Waybill number is not shown, enter it. YES NO* N/A
- 4. The number of pages shown YES NO* N/A
- 5. The non-applicable Aircraft Type Deleted YES NO* N/A
- 6. If full name of Airport or City of Departure or Destination is not shown, enter it. YES NO* N/A
- 7. The word "Radioactive" deleted YES NO* N/A

Identification

- 8. UN or ID Number preceded by prefix YES NO* N/A
- 9. Proper Shipping Name and the technical name in brackets YES NO* N/A
- 10. Class or Division number YES NO* N/A
- 11. Packing Group YES NO* N/A

Quantity and Type of Packing

- 12. Number and Type of Packages YES NO* N/A
- 13. Quantity and unit of measure (net, or gross followed by "G", as applicable) within per package limit..... YES NO* N/A
- 14. When different dangerous goods are packed in one outer packaging, the following rules are complied with:
 - Compatible according to Table 9.3.A..... YES NO* N/A
 - UN packages containing Division 6.2 YES NO* N/A
 - "All packed in one (type of packaging)" YES NO* N/A
- 15. Overpack
 - Wording "Overpack Used" YES NO* N/A

Packing Instructions

- 16. Packing Instruction Number YES NO* N/A

Additional Handling Information

- 17. Name and Telephone Number of a responsible person for Division 6.2 Infectious Substance shipment..... YES NO* N/A
- 18. The air transport statement included YES NO* N/A
- 19. Name and Title (or Department) of Signatory, Place and Date indicated YES NO* N/A
- 20. Signature of Shipper YES NO* N/A

AIR WAYBILL – HANDLING INFORMATION

- 21. The statement: "Dangerous goods as per attached Shipper's Declaration" or" "Dangerous Goods as per attached DGD"..... YES NO* N/A
- 22. "Cargo Aircraft Only" or "CAO", if applicable YES NO* N/A

PACKAGE(S) AND OVERPACKS

- 23. Packaging conforms to packing instruction and is free from damage or leakage YES NO* N/A
- 24. Same number and type of packagings and overpacks delivered as shown on DGD YES NO* N/A

Markings

- 25. UN Specification Packaging Used
- 26. The UN or ID number(s)
- 27. The Proper Shipping Name(s)
- 28. The full name(s) and Address(es) of Shipper and Consignee
- 29. For consignments of more than one package of Classes 2 to 6 & 8 the net quantity, or gross weight followed by "G", as applicable, marked on the packages
- 30. Carbon Dioxide, Solid (Dry Ice), the net quantity marked on the packages
- 31. The Name and Telephone Number of a responsible person for Division 6.2 Infectious Substances shipment

Labelling

- 32. The label(s) identifying the Primary risk
- 33. The label(s) identifying the Subsidiary risk next to Primary risk label(s)
- 34. Cargo Aircraft Only label, on the same surface near the Hazard label(s)
- 35. "Orientation" labels, if applicable
- 36. All above labels correctly affixed

For Overpacks

- 37. Packaging Use markings and hazard and handling labels, as required must be clearly visible or reproduced on the outside of the overpack
- 38. The word "Overpack" marked if all markings and labels are not visible
- 39. "Cargo Aircraft Only" restrictions

* - If any item is checked "No", correct the issue before giving to carrier.