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Shipping Samples to Maryland Animal Health Laboratories

Federal regulations govern the packaging and labeling of diagnostic specimens. **It is CRITICAL samples are packaged to prevent breakage of containers and leakage. Couriers will hold packages that leak during transit and may charge fines. If spillage occurs during transit that damages other mail, equipment or causes harm to personnel; the shipper may face prosecution even if the material involved was not infectious or hazardous.** In extreme cases with blood leaks, hazmat teams will seize and dispose of packages.

There are three classes of biological materials that can be shipped; Category A, Category B, and Exempt Animal/Human Specimen (see definitions on the last page of the document).

All items shipped to MDA Animal Health Laboratories must meet at least the following:

1. Appropriate labeling:

a. Exempt Samples

- i. Exempt samples must be labeled “Exempt Animal Specimen” on the outside of the shipping container. Exempt animal samples include samples for surveillance/routine testing and are not likely to contain a disease agent.
- ii. Consignor and Consignee information – Name, address, and phone number.



b. Category B Samples

- i. Category B samples must be labeled with the words “Biological substance, Category B” and a UN3373 hazard label.
- ii. Consignor and Consignee information – Name, address, and phone number.
- iii. If shipping samples that are collected outside Maryland, please contact the laboratory for permits and instructions.



c. Category A Samples

- i. Contact the lab to confirm if they can receive the sample and for additional information.

2. The package must consist of three components:

a. Leak-proof primary receptacle

- i. Example: fecal jar, formalin jar, conical tube, blood tube, etc.
- ii. Containers with screw on lids should be wrapped with parafilm or tape to prevent leaking.

b. Leak-proof secondary packaging

- i. Secondary packaging includes cylinders or airtight/waterproof bags (Ziploc®).
- ii. For liquids, absorbent material sufficient to absorb the entire contents must be placed inside secondary packaging.
Example: Blood tube and absorbent material placed inside a Ziploc® bag.
- iii. Multiple fragile primary receptacles (example: blood tubes) must be wrapped or separated to prevent contact between them. Examples include wrapping individual tubes with bubble wrap, Styrofoam tube mailers, or cardboard tube rack boxes.



c. Strong outer packaging of adequate strength for its capacity, mass, and intended use.

- i. Couriers are now required to reject all sample packages that are being shipped in Styrofoam containers or coolers. The proper way to ship Styrofoam coolers is to use a cardboard box as the outer packaging type.



3. Between secondary packaging and outer packaging

- a. Gel ice packs (for refrigerated specimens)
 - i. Put gel ice packs in Ziploc® bags with absorbent material to ensure the ice packs do not leak.
 - ii. Ship in an insulated shipping container
- b. Submission form in waterproof bag (Ziploc®)
- c. Packing material (crumpled papers, bubble wrap, air pillows, etc.) to cushion and insulate samples.

For more visual examples on how to properly package samples for submission, [click here](#).

For instances where dry ice is used to ship, please contact the receiving lab for instructions on proper labeling and packaging of the samples.

Most specimens shipped to the Maryland Animal Health Laboratories will either be Category B or Exempt Animal Specimens and shipped under refrigerated conditions using gel ice packs. Samples requiring refrigeration include blood, fluids, feces, cultures, swab collections, and fresh tissue specimens, and should arrive the day following collection. Exceptions to refrigeration include samples in formalin and fungal cultures.

Note: Samples shipped under refrigerated conditions MUST arrive at the laboratory with ice packs and samples that are still cool to the touch. If the samples are received warm or hot, samples may be rejected. If samples are run, a note will be added to the lab report to indicate how they were received, and results should be interpreted with caution.

Overnight shipping of samples is highly recommended. Overnight shipping is available via UPS for a fee. Contact the Frederick Animal Health Laboratory at 301-600-1548 for further information.

Packaging instructions to prevent problems associated with improper packing

- Use gel packs that are completely frozen. Do not use frozen water-filled plastic bags as ice packs.
- Put gel ice packs in Ziploc® bags with absorbent material to ensure the ice packs do not leak.
- Protect the submission form from moisture by enclosing it in a waterproof bag.
- Each specimen should be placed in a separate, clearly labeled container.
- Label tubes numerically and reference the numbers to animals' IDs on submittal form.
- Multiple fragile primary receptacles (example: blood tubes) must be wrapped or separated to prevent contact between them. Examples include wrapping individual

tubes with bubble wrap, Styrofoam tube mailers, or cardboard tube rack boxes (see Figure 2).

- Slides for cytological evaluation should be protected from formalin fumes.
- Include packing material to cushion containers to prevent primary receptacles, such as glass tubes, from breaking. Examples include crumpled papers, bubble wrap, air pillows, etc.
- **Laboratories are closed on weekends and State Holidays.** Make sure packages arrive on the days the lab is open, otherwise samples will not be received or accessioned until the next business day. State holidays are New Years Day, Martin Luther King, Jr. Day, Presidents Day, Memorial Day, Juneteenth, Independence Day, Labor Day, Columbus Day, Election Day, Veteran's Day, Thanksgiving Day, American Indian Heritage Day, and Christmas Day.

Example of a properly packaged submission

- Specimen and absorbent material placed inside a leakproof container (example: Ziploc® or sealable biohazard bag.)
- Ice packs in the shipping container surrounding the sample.
- Packing materials placed in empty spaces to cushion samples.
- Sample identification (submission form) enclosed in a Ziploc®.
- Contents placed in insulation with a strong outer box of adequate strength for its capacity, mass, and intended use.



Examples of Improper Shipping and Sample Submissions

A single tube was shipped to the lab in a box without closed secondary packaging and absorbent material.



How it should have been shipped:

- Smaller box could be utilized to reduce wasted space.
- Tube and absorbent material enclosed in a leakproof container, such as a Ziploc®.
- Ice packs in the shipping container surrounding the sample.
- Packing material placed in empty spaces to cushion samples.
- Submission forms placed in Ziploc® separate from samples.
- Contents placed in insulation with a strong outer box of adequate strength for its capacity, mass, and intended use.

Sample receptacles broken in transit



How it should have been shipped:

- Tubes placed in tube holders in numerical order.
- Tubes and absorbent material enclosed in a leakproof container (Ziploc® bag).
- Packaging material placed in empty spaces to cushion samples.
- Ice packs in the shipping container surrounding the sample.
- Submission form enclosed in a Ziploc® bag.
- Contents placed in insulation with a strong outer box of adequate strength for its capacity, mass, and intended use.

Samples were shipped only in the Styrofoam box



How it should have been shipped:

- Place Styrofoam shell in cardboard box.
- Packing materials placed in empty spaces to cushion samples.
- **Couriers are now required to reject all sample packages that are being shipped in Styrofoam containers or coolers.** The proper way to ship Styrofoam coolers is to use a cardboard box as the outer packaging type.

Dirty, illegible sample submitted



How it should have been shipped:

- Tubes clean and free of blood and feces.
- Clear and legible writing to identify samples.

Bulk accession shipped in multiple bags with no cushioning or absorbent material



How it should have been shipped:

- Tubes placed in tube holders in numerical order.
- Tube rack and absorbent material placed in leak proof container (larger Ziploc® bags can be utilized).
- Ice packs in the shipping container surrounding the samples.
- Packing materials placed in empty spaces to cushion samples.
- Contents placed in insulation with a strong outer box of adequate strength for its capacity, mass, and intended use.

Tips for Shipping Samples in Hot Weather

You can't do anything to affect the temperature outside so you need to do everything you can to control the temperature of your samples inside the shipping container during transit to the lab. No matter what courier you use, packages can be left outside on loading docks or are transported in hot trucks before being delivered to the laboratory.

Unrefrigerated and warm samples can degrade quickly, drastically reducing their diagnostic value. Specimens that require refrigeration and arrive at the laboratory at ambient temperatures may be rejected.

- We strongly encourage using a shipping method that will ensure your samples arrive at the diagnostic lab within 24 hours. Prolonged delivery times keep samples in the hot environment longer.
- Temperature control begins as soon as you collect the samples. All samples should be refrigerated as soon as possible after collection until the time they arrive at the laboratory.
- Pack samples in insulated containers such as cardboard box with Styrofoam box inside.
- Ensure gel packs are completely frozen before use.
- Melting ice packs sweat a lot! Place gel ice packs in a Ziploc® bag with absorbent material.
- Surround specimens with frozen gel packs.
- Ensure samples are packed close enough to ice packs to keep them cold.
- Use multiple frozen gel packs in each insulated container. Use enough gel packs to keep specimens cold for 48 hours in case of shipping delays.
- Cold packs should not be enclosed in the same bag as the sample.
- Maximize insulation and cushion specimens by packing all remaining empty space with packing material (examples: newspaper, large crumpled shipping paper, absorbent tissues, bubble wrap, air pillows, etc.)
- Paperwork should be packaged separately from samples in a leakproof plastic bag to keep dry and clean.
- Secure the lid of the Styrofoam box.

Tips for Shipping Samples in Cold Weather

When you're shipping diagnostic specimens in cold weather - freezing may destroy or decrease the diagnostic quality of a shipped sample. Specimens that arrive at the laboratory frozen may be rejected. To avoid freezing samples, consider:

- Shipping overnight - prolonged delivery times keep samples in the colder environment longer and increases the likelihood of freezing.
- Use an insulated shipping container - cardboard box with Styrofoam box inside.
- Fill dead space in the box with packaging material to provide additional insulation.
- Keep samples centered in the box to avoid the colder sides.
- Do not use frozen gel packs when the outside temperature is freezing. Frozen gel packs combined with freezing temperatures will increase the likelihood of samples freezing.
- Use chilled/refrigerated gel packs for samples that need to be refrigerated. The environment inside the box will start off chilled, and the gel pack will prolong the time it takes the sample to freeze.
- For samples that do not need to be chilled/refrigerated (for example, biopsy samples in formalin), use room temperature (un-chilled) gel packs to increase ambient mass. This will reduce the temperature decline during transit, however it is not a guarantee against freezing if extended cold exposure occurs.
- If possible, consider hand delivering samples instead of shipping.

Definitions:

Biologic material: A material known or reasonably expected to contain a pathogen.

Pathogen: A microorganism (including bacteria, viruses, rickettsiae, parasites, or fungi) or other agent, such as a proteinaceous infectious particle (prion), that can cause disease in humans or animals. ([49 CFR 173.34](#))

Infectious substance: A material known or reasonably expected to contain a pathogen. An infectious substance must be assigned the identification number UN2814, UN2900, UN3291, UN3373, or UN3549 as appropriate, and must be assigned to one of the following categories ([49 CFR 173.34](#)):

Category A: Substances transported in a form that, when exposure to it occurs, is capable of causing permanent disability, life-threatening or fatal disease in otherwise healthy humans or animals. Based on known medical history, symptoms, endemic local conditions or professional judgment (see Table 1). Includes patient specimens of substances in this Category. A Category A infectious substance must be assigned to identification number UN2814, UN2900, or UN3549, as appropriate.

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. This includes Category B infectious substances transported for diagnostic or investigational purposes. A Category B infectious substance must be described as “Biological substance, Category B” and assigned identification number UN3373.

Exempt Animal/Human Specimen: A specimen for which there is minimal likelihood that pathogens are present and doesn't contain other hazardous materials. Specimens include, 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.

NOTE: In determining whether a specimen has minimal likelihood that pathogens are present, an element of professional judgement is required. The judgement should be based on known medical history, symptoms, individual circumstances, and endemic local conditions.