UNH Guidelines for Shipment of Formaldehyde Solutions by Air

This guide applies to shipments of formaldehyde in solutions of less than 10%.
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I. Introduction

The U.S. Department of Transportation (DOT) and the International Air Transport Association (IATA) regulate shipments of some concentrations of formaldehyde because it is a hazardous material. As a result, specific procedures must be followed when packaging and shipping formaldehyde and a record of training must be kept.

*Shipments made according to guidelines in this document may only be made by a person who has received a record of training from the Office of Environmental Health and Safety (OEHS).*

Note: Formaldehyde solutions are not permitted to be transported in checked baggage, carry-on baggage, or airmail.

This guide applies to shipments of formaldehyde in solutions of less than 10%. Packages prepared according to this guide must not contain any materials other than those described in this document (i.e. containers holding formalin-preserved specimens and related absorbent or packaging materials). Laboratory or sampling equipment, unrelated documents, or other goods must be packaged and shipped in separate boxes.

II. Training Requirements

Federal rules require that anyone wishing to ship hazardous materials must first have shipping training. If you are going to package formaldehyde for shipment or fill out any type of shipping documentation (e.g., a FedEx Airbill) for a shipment of formaldehyde solutions, you must follow the training certification requirements outlined below.

1. **Read this guide.** This guide will explain proper packaging, marking, and labeling of formaldehyde solutions as well as preparation of documentation.

2. **Submit to OEHS a Intent to Formaldehyde Solutions by Air form** *(Appendix A).* OEHS will review this form with you and, upon successful completion, will certify you to ship formaldehyde solutions.

You are required to renew your certification every two years. Training sessions reviewing the material in this manual are available from OEHS. Call 862-5038 to schedule training or to ask questions regarding the shipment of formaldehyde solutions.

III. Hazard Identification

Formaldehyde solutions of less than 10% are not considered hazardous materials; concentrations above this amount are subject to specific requirements not discussed in this document. Formaldehyde solutions can cause eye, skin, and respiratory tract irritation. Formaldehyde is regulated by Occupational Safety and Health Administration (OSHA) as a carcinogen. Additionally, exposure to formaldehyde solutions may cause an allergic respiratory reaction. Be sure to review the manufacturer Material Safety Data Sheet (MSDS) before handling or shipping any hazardous material.
IV. Packaging

Properly packaging shipments of formaldehyde solutions will minimize the chance of leakage during transportation. Properly labeling and documenting these shipments will communicate the hazard to transport workers who may be exposed to the formaldehyde in the event of a leak.

A. Quantity Limits
There are no quantity limits for shipment of solutions of less than 10% formaldehyde.

B. Package Components
Packaging for formaldehyde solutions must have three basic components:

1. Inner (primary) packaging, such as a vial, tube, jar, etc. Do not completely fill inner packagings; allow 10% head-space for liquid expansion. Liquids must not completely fill inner packagings at a temperature of 55°C (130°F). Closures of inner packagings must be held securely in place with tape, wire, metal crimps, or other positive means.

2. Intermediate (secondary) packaging, such as a ziplock or other plastic bag. Use good quality bags that are well sealed. Intermediate packaging must contain enough absorbent material to absorb all contents and must not react with the formaldehyde. Use two plastic bags: put the absorbent and the inner container(s) in the first bag and seal it well with tape. Then seal this bag in another bag for added protection.

3. Outer packaging, such as a cardboard box. Formaldehyde solutions may not be shipped in envelopes, Tyvek® sleeves, or other non-rigid mailers. The dimensions of the outer box must be at least 100 mm (~4 inches) on two sides.

C. Package Labels
The outer packaging must display the name and address of the shipper and consignee. Many printer inks run when exposed to small amounts of water, such as rain or snow. Therefore, it may be necessary to cover each label you have affixed to the box with clear plastic tape. Also, when re-using shipping boxes, completely obliterate all unnecessary labels and marks.

D. Package Tests
A representative example of packaging used for formaldehyde solutions must pass a drop test and compressive load test without any breakage or leakage of any inner packaging and without any significant reduction in package effectiveness. Perform the following tests on a representative example of your packaging and keep a record of the results.

1. Drop Test. Drop a representative package from a height of 1.8 m (5.9 feet) directly onto a solid unyielding surface:
   a. One drop flat on bottom;
   b. One drop flat on top;
   c. One drop flat on the long side;
   d. One drop flat on the short side; and
   e. One drop on a corner at the junction of three intersecting edges.

2. Compressive Load Test. Apply a force to the top surface of a representative package for a duration of 24 hours, equivalent to the total weight of identical packages if stacked to a height of 3 meters.
Appendix A. Intent to Ship Formaldehyde Solutions by Air

After reading the UNH Guidelines for the Shipment of Formaldehyde Solutions by Air, fill out this form to qualify to formaldehyde solutions at UNH. OEHS will review the completed form with you and, upon successful completion, will certify you to ship formaldehyde solutions. The certification will expire after two years.

1) Why are formaldehyde solutions considered hazardous materials?

2) Which of the following labels/markings must appear on a package containing formaldehyde solutions of less than 10%? Check all that apply.

- Class 9 hazard label
- Class 8 hazard label
- Orientation arrows
- An Excepted Quantity of Dangerous Goods label
- “To:” and “From” addresses

3) The Excepted Quantity of Dangerous Goods label is required for shipments of formaldehyde in concentrations of less than 10%.

   a) True
   b) False

4) It is okay to ship formaldehyde in concentrations greater than 10% using this guide?

   a) True
   b) False

5) How much absorbent is required to be included in shipments of formaldehyde solutions?

6) I can ship formaldehyde solutions in quantities greater than 30 mL per container using this guide?

   a) True
   b) False

I understand the hazards associated with formaldehyde and the shipping requirements for formaldehyde solutions, as outlined in this guide.

| Print Name: |   |
| Signature:  |   |
| Department: |   |
| Date:       | Phone: |

Please return in campus mail to EHS, 11 Leavitt Lane.