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**Oak Ridge National Laboratory (ORNL)  
Transportation and Packaging Management (TPM)  
Container Preparation and Filling Instructions/Checklist**

**Non-Returnable Type A ORNL Corrugated Fiberboard Box**

**ORNL-PKG-06, Rev. 1**

**Issued: 5/15/1997**

**Revised: 5/30/2000**

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**NOTE 1:** This package is certified for shipment of Type A amounts of radionuclides in solid or liquid form. The package consists of an 8-inch cube fiberboard box, an inner metal can positioned by spacers within the fiberboard box, and several possible configurations of primary containment and shielding. Refer to DOE/RL-96-57 for test documentation and details. Three of the possible configurations of primary containment and shielding are shown below. Other configurations may be used if shown to have equivalent safety.

SHIELDING	PRIMARY CONTAINMENT
1/2" wall lead shield	15 ml or 25 ml bottle
1" wall lead shield	15 ml or 25 ml bottle
Schedule 40 steel pipe sleeve	15 ml or 25 ml bottle

**NOTE 2:** ORNL TPM personnel do not handle unpackaged radioactive material. The requester must package the material in the primary container before ORNL TPM personnel complete the packaging. The requester may or may not place the primary container into a lead shield or steel pipe sleeve, depending on radiation dose, on-site transfer requirements, and other packaging arrangements. ORNL TPM personnel will provide primary containment bottles, lead shields, and steel pipe sleeves prepared for shipment to the requester. The requester then fills the bottle, places it into the prepared lead shield or steel pipe sleeve, and arranges for ORNL TPM to complete the packaging.

**NOTE 3:** The pressure requirement for air shipments of liquid materials (95 kPa [13.8 psi]) must be met by the primary container (bottle or vial).

**NOTE 4:** The following steps are not necessarily consecutive and/or in sequence depending on packaging arrangements made between the Packaging Supervisor and the requester. (For example, the primary containment bottle may be inspected and given to the requester to be filled several weeks before it is placed into the metal can, and fiberboard boxes may be assembled in advance.)

**A. Non-Returnable Type A ORNL TW Fiberboard Box  
Stores Catalog No. 02-114-9900**

**Operating  
Personnel**

1. Visually inspect the following and report any deficiencies to the Packaging Supervisor:
  - " Triple-wall corrugated fiberboard box  
(8-1/8" x 8-1/8" x 8-1/8", DOT Spec UN 4G/Y 30/S)
  - " Double-wall corrugated fiberboard inserts
  - " Metal can (Spec 2N [4 1/2" ID x 7" IH])  
*Stores Catalog No. 10-090-5530*
  - " Lead Shielding
  - " Steel pipe sleeve
  - " Primary container (duraglass bottle, or equivalent)

**FOR INTERNAL USE ONLY**

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### A. Non-Returnable Type A ORNL Corrugated Fiberboard Box Stores Catalog No. 02-114-9900

#### Operating Personnel

2. Ensure that primary container(s) are pressure tested to 95 kPa (13.8 psi) for air shipments.
3. Select a fiberboard tube appropriate for the size inner bottle to be used and place the bottle inside the tube.
4. Select a 1/2" or 1" wall lead pig or steel pipe sleeve depending on the amount of shielding required for the material to be shipped.
5. Wrap Kimpack around the fiberboard tube so that the space between the tube and the lead pig or pipe sleeve is filled.

*Kimpack is a trademark of Kimberly-Clark Corporation.  
Stores Catalog No. 10-622-7224 (no substitution)*

**NOTE:** For liquid shipments, there must be sufficient Kimpack to absorb twice the volume of the liquid contents.

6. **IF** using a lead pig, **THEN**  
Place Kimpack in the bottom of the lead pig to cushion the bottle.
7. **IF** using a pipe sleeve, **THEN**  
Wrap Kimpack around the outside of the pipe sleeve so that the space between the pipe sleeve and the metal can (top, bottom, and side) is filled.
8. Place the lead pig or pipe sleeve assembly into the metal can.
9. Seal the metal can.

**NOTE:** Prior to shipment or once a week, whichever is less frequent, validate the canning method to ensure quality assurance requirements are being met.

10. Place information labels on the can to indicate contents and/or to warn of potential contamination inside the can.
11. Fold the fiberboard box and staple the bottom flaps with a minimum of five (5) staples.
12. Fold a fiberboard insert and place into the bottom of the fiberboard box.
13. Place the can into the insert and place the second insert over the can so that the slots in the two inserts interlock.
14. Fold the top flaps of the box and close with a minimum of five (5) staples.

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**Operating  
Personnel**

15. Place a "radioactive" marking, address label, or other marking over the seams in the top and bottom of the box to serve as tamper indicating seals or attach controlled, numbered, mylar seals for accountable materials, if required.
16. Record the controlled, numbered, mylar seal information on the Seal Log Sheet, if applicable.
17. Ensure that the gross weight of the package does not exceed 15 kg (33 lbs.)

**Prepared by:** ORNL TPM Organization

**Approved by:** Jeff Shelton May 25, 2001

Jeff Shelton, Manager (576-6401)  
ORNL TPM - Packaging Operations