

UNLOADING PROCEDURE
FOR
FRONTIER TECHNOLOGY CORPORATION
MODEL 50220 SHIPPING PACKAGE
WITH
WEP PLUG FOR SOURCES IN HOLDERS

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DISCLAIMER

These procedures are provided to supply information concerning the mechanical construction of the shipping package and the mechanical steps associated with unloading and loading the package. They are not designed or intended, and cannot be used, to replace proper radiological health procedures to be followed when handling radioactive materials. The package should be unloaded or loaded only in the presence of a Radiation Safety Officer and only by persons trained and authorized to handle radioactive materials.

I. GENERAL DESCRIPTION

The Frontier Technology Corporation Model 50220 shipping package is a Type A package meeting DOT Specification 7A. The package is designed to transport Special Form Californium-252 neutron sources up to approximately 50 micrograms, but it may also be used to transport Type A quantities of other radioactive materials in Special Form provided that pertinent regulations are complied with.

The Model 50220 container is constructed per Frontier Technology Corporation (FTC) drawing number A50220. Basically, it is a 30-gallon USDOT Specification steel drum filled with water-extended-polyester (WEP) shielding material. The radioactive source is located in a cavity in a WEP plug which in turn is located within an 3" schedule 40 PVC pipe. Weight of the container is approximately 275 pounds.

II. ACTIONS TO BE TAKEN UPON RECEIPT OF LOADED PACKAGE

CAUTION: These steps should be performed under supervision of your Radiation Safety Officer or by persons trained and authorized to handle radioactive materials.

A. Monitor Radiation:

Survey total Gamma and Neutron radiation fields. Verify Transport Index stated on package.

B. Monitor Radioactive Contamination:

Perform smear test of package surfaces for removable radioactive contamination.

C. Check Security Seal:

A security seal should be present. The seal is in the form of a wire through the body of the bolt holding the bolt ring onto the package, with the ends of the seal wire embedded into a lead seal having raised letters "FTC". Verify the presence of the seal and that the lead seal disk has the Frontier Technology Corporation logo "FTC".

D. Immediately notify Frontier Technology Corporation of any improper conditions.

III. ACTIONS TO BE TAKEN PRIOR TO OPENING THE PACKAGE

A. Examine Drawings and Unloading Procedure:

Examine drawing of the shipping package and Figure 1 of this procedure. Read this procedure completely through. If any steps are unclear or if you have any questions, call Frontier Technology Corporation, telephone number (937) 376-5691.

B. Place the Container:

Move the container to the location where it is to be unloaded. This location should be in a restricted area covered by your radioactive materials license.

C. Obtain Tools Necessary to Unload the Package:

Tools required:

- Wire cutters
- 15/16-inch wrench
- Number 12 pipe wrench
- Pliers

D. Remove the bolt ring and drum cover

E. Just inside the drum is a black PVC pipe cap threaded inside a six inch schedule 40 PVC pipe. Remove the PVC pipe cap by turning counter clockwise using a number 12 pipe wrench. Use caution not to damage the PVC cap.

F. The top of a WEP shield plug is now visible inside the PVC pipe. The plug has a cavity in its top, inside of which is the upper end of a lag bolt. Grasp the exposed bolt end with pliers and remove the plug by pulling vertically upward. The plug is a close fit into the pipe and may have to be rotated slightly as it is being lifted.

G. The upper end of the source assembly is now exposed. Using a pair of 12" tongs or other handling tool grab the threaded end of source and remove from center plug.

CAUTION: THIS WILL EXPOSE THE UNSHIELDED SOURCE. THE NEUTRON AND GAMMA RADIATION LEVELS IN AIR AT ONE METER FROM AN UNSHIELDED _____ MICROGRAM CF-252 SOURCE ARE APPROXIMATELY _____ mREM/HR AND _____ mREM/HR, RESPECTIVELY. CAREFULLY MONITOR NEUTRON AND GAMMA RADIATION LEVELS. USE DISTANCE AND/OR SHIELDING TO REDUCE EXPOSURE TO PERSONNEL.

- H. Remove all sources following the above procedure. Unloading is now complete. Prepare the package for return to Frontier as outlined below.
- I. Perform a wipe test for removable contamination on the internal surfaces of the package and the surfaces of the internal components. The removable contamination averaged over each 300 sq cm of surface must not exceed 10^{-4} uCi/sq cm (220 dpm/sq cm) alpha and 10^{-3} uCi/sq cm (2200 dpm/sq cm) beta-gamma [49 CFR 173.427 (c) and 173.443 (a)].
- J. Replace the PVC pipe cap, securing it to the package by turning it clockwise. Hand tighten only.
- K. Inspect the gasket on the inside of the drum cover. If not in good condition, replace it.
- L. Replace the drum cover onto the drum.
- M. Replace the bolt ring and tighten the bolt and lock nut securely.
- N. Place a seal wire through the hole in the bolt and seal.
- O. Remove or cover the Radioactive labels (i.e., yellow diamonds) from the container and place two DOT "Empty" labels on the container, one on each side. [Required by 49 CFR 173.427. Label specification is 49 CFR 172.450].
- P. Survey the package for neutron and gamma radiation. Total level at any point on the external surface of the package must not exceed 0.5 mRem/hr. [49 CFR 173.427(a) and 49 CFR 173.421(b)].
- Q. Survey the external surfaces of the package for removable contamination using the swipe test method. Maximum permissible levels over any 300 square centimeter swipe area are 10^{-6} uCi/sq cm (2.2 dpm/sq cm) alpha and 10^{-5} uCi/sq cm (22 dpm/sq cm) beta-gamma. [49 CFR 173.427(a), 173.421(c), and 173.443(a)].
- R. Remove the statements "Special Form", "Non-Fissile" and "UN3332" from each side of the package and replace with: "Excepted Package, Empty Packaging" and "UN2908", also on each side of the package. Marking must be in a color which contrasts with the color of the package where the marking is put, the letters must be at least 1/2 inch high, and the marking material must be durable.

EXAMPLE

RADIOACTIVE MATERIAL
 TYPE A PACKAGE
 SPECIAL FORM, NON-FISSILE
 CLASS 7 UN3332

REPLACE WITH

RADIOACTIVE MATERIAL
 TYPE A PACKAGE
 EXCEPTED PACKAGE, EMPTY PACKAGING
 CLASS 7 UN2908

- S. Mark package with the name and address of consignee and the name and address of consignor, making clear which is which.

- T. Examine package for damage and completeness. The package must be in unimpaired condition and securely closed so that there will be no leakage of radioactive material under conditions normally incident to transportation.
- U. The package is now ready to ship. It must be shipped as a hazardous material with appropriate shipping paper and shipper's declaration.