

Certificate of Compliance For Specification 7A Packaging

Amersham HEALTHCARE

DESCRIPTION OF PACKAGE

See Appendix I for illustration of the ammo box packaging design. The general configuration of the package design features the primary packaging consisting of a plastic syringe with a hypodermic needle which is covered by a plastic sleeve. The syringe is enclosed inside a lead lined container which has a gasket screw type closure. The lead lined container (syringe lead pig) is nested into a high density foam insert. The foam insert secures the lead lined container preventing any lateral movement. The foam insert nests inside a steel box. The lid of the ammo box features a rubber gasket that provides a water tight seal. A small plastic band (security seal) is positioned through the latch of the lid and handle on the side panel of the ammo box as a tamper indicating seal. Appendix II contains a list of the packaging components with part numbers and descriptions.

External Dimensions: 12" (305 mm) x 6-3/32" (155 mm) x 10-5/16" (262 mm)
Weight: 50 lbs (110 kg)

AUTHORIZED CONTENTS

Physical Form: All (Solid, Liquid, Gas) Weight: 50 lbs.

Radioactivity of the material must not be greater than the A₂ value listed in 49 CFR 173.435. No fissile material is authorized in this package.

OPERATING INSTRUCTIONS

Place the syringe into the base of the lead pig allowing the syringe to nest in the grooved area of the base. Inspect the top of the lead pig to ensure the gasket is in place. Carefully place the top of the pig onto the base, and turn the top slightly more than 2 rotations to secure the top to the base. Place a maximum of ten lead pigs into the high density foam insert which is nested in the ammo box. Close the lid of the ammo box and fasten security seal.

REGULATORY REQUIREMENTS

This package has been tested according to a Test Plan, and all tests results have been documented. See Appendix III for Test Protocol and Results. An evaluation report has been completed documenting compliance with standard and general design requirements in Title 49 Code of Federal Regulations. These documents are on file at Amersham's Arlington Heights facility. The packaging is authorized for use as tested. Deviations from the tested packaging system will require retesting. It is the shipper's responsibility to ensure that the package meets all of the requirements in 49 CFR 173.475 "Quality Control Requirements Prior to Each Shipment of Radioactive Materials" in Appendix IV.

Kyle Hamilton
Corporate Transportation Officer

1/6/93
Date

Christie R. ...
Corporate Radiation Safety Officer

1/6/93
Date

APPENDIX 1

PACKAGING CONFIGURATION

Plastic Syringe
Part No:

- 99-0542
- 99-0543
- 99-0544
- 99-0545
- 99-0548
- 99-0601
- 99-0602

Lead Lined Containers (Lead Pigs)
Part No:

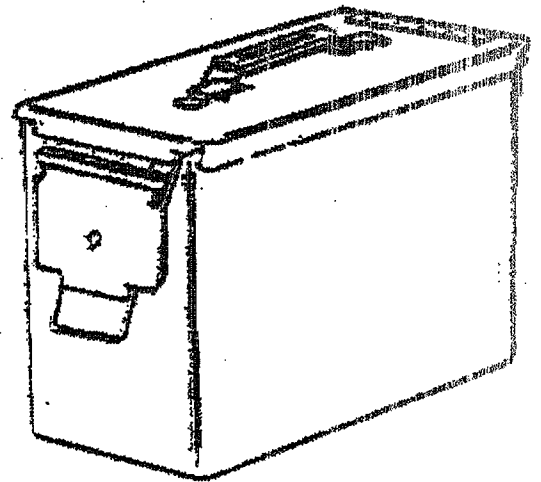
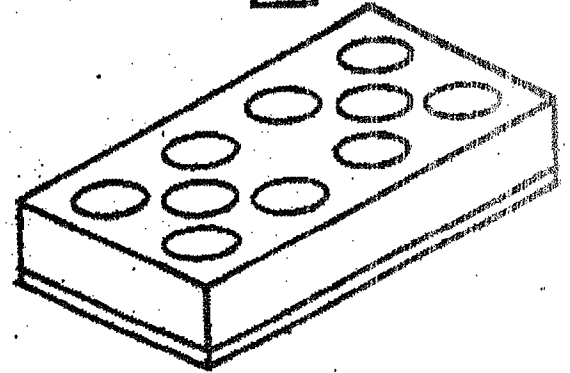
- 99-0526
- 99-0527
- 99-0538

Foam Insert
Part No:

99-0518

Ammunition Box

Part No: 99-0501



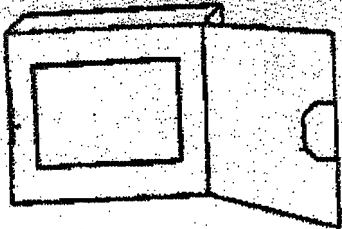


30-0021
30-0416
99-0557

99-0542
99-0543
99-0544
99-0545
99-0601
99-0602



31-0222
31-0223
31-0224

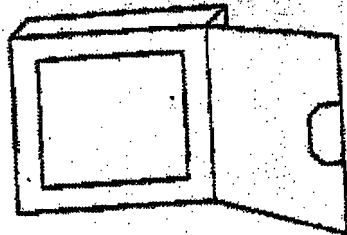


99-0558

99-0526
99-0527

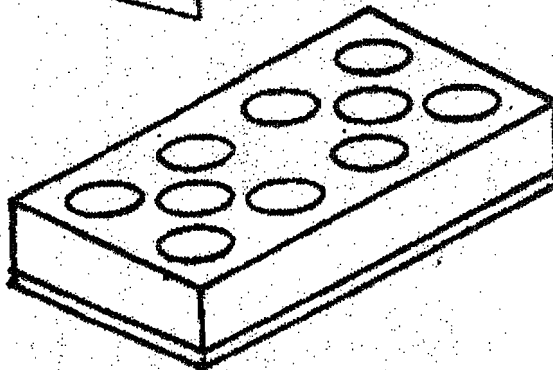


30-0210

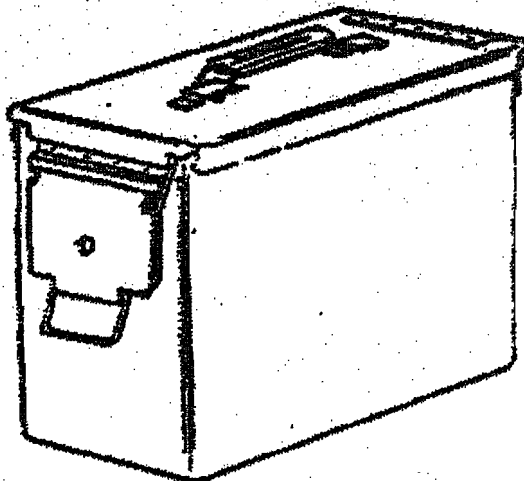


99-0559

99-0518



99-0501



ATTENULA B

COMPONENTS	PART NO.	DESCRIPTION/DIMENSIONS
Ammo (Ammunition) Box	99-0501	Water-tight 13 gauge steel box. 12" x 6-3/32" x 10-5/16"
10 Hole Foam Insert	99-0518	High density foam. 11" x 5-5/8" x 2-11/16"
White Syringe Lead Pig	99-0526	Lead lined container with gasket screw type closure. 9-1/4" in height, 4.4 lbs.
Light Blue Syringe Lead Pig	99-0527	
1 CC Syringe	99-0542	Stainless steel needle which is epoxy bonded to a polypropylene hub. Plunger consists of medical grade rubber.
3 CC Syringe	99-0543	
5 CC Syringe	99-0544	
10 CC Syringe	99-0545	
20 CC Syringe	99-0601	
60 CC Syringe	99-0602	
10 ml Vial (stopper with metal seal)	99-0557	Glass container with rubber gasket which is secured by a metal crimped seal. 2-3/16" x 7/8" dia.
MP4 Screw Top Vial	Vial 30-0024 Top 31-0236	Threaded glass container with plastic screw type cap. 1-7/8" x 11/16" dia.
MP4 (stopper with metal seal)	30-0416	Glass container with rubber gasket which is secured by a metal crimped seal. 1-7/8" x 11/16" dia.
CDC Container	Blue 31-0222 Yellow 31-0223 Green 31-0224	Lead lined container. 3-1/2" x 1-15/16" dia.
MP4 Container	31-0210	Lead lined container. 2-5/8" x 1-7/16"
CDC Fiberboard Insert	99-0558	40 point fiberboard. 5-5/8" x 2-1/8" x 7"
MP4 Fiberboard Insert	99-0559	40 point fiberboard. 5-5/8" x 1-1/2" x 7"
CDC Corrugated Filler	99-0560	6 flute corrugated sheet which is scored through 5 flutes in the middle of the sheet.
MP4 Corrugated Filler	99-0560	6 flute corrugated sheet which is scored through 5 flutes in the middle of the sheet.

French Square Bottles	99-0521	Threaded glass container with plastic screw type cap. 1 x 1 x 2-5/8"
I-131 Large Lead Pig		Largest Lead container. 5-1/4" x 3-1/2" dia. 12 lbs. (5.5 kg)
I-131 3 - Piece Foam Insert	99-0516	High density foam providing 2-1/8" of cushioning.
Krypton Generator		Plastic lead lined container. 8" x 5-1/2" dia. 35 lbs. (15.75 kg)
Corrugated Insert for Krypton Generator		Corrugated board scored for folding.
Security Seal	99-0513	Light-weight plastic band seal.

APPENDIX III

TEST PROTOCOL AND RESULTS

1. Preparations for specimens for testing (49 CFR 173.462)

Each test sample was evaluated prior to testing and found acceptable. This information is recorded in an evaluation report.

2. Free Drop Test from 30 Feet (49 CFR 173.466 (a)(1))

Release Orientation : Top of package.
Impact Orientation : Bottom corner.
Target : Concrete slab.

Results: Minimal damage and package fatigue. Bottom of ammo box bulged approximately 0.5". Lead pigs incurred minor scratches and are completely usable. There was no sign of leakage on the outside of the lead pig. The syringe was not damaged and there was no leakage found.

3. Compression Test (49 CFR 173.465 (d))

External Dimensions : 12" x 6" x 10"
Weight : 50 lbs.
Vertical Projected Area : 0.50 ft²
Weight X 5 : 250 lbs.
Area X 265 lbs/ft² : 132 lbs.
Largest Calculated Load : 250 lbs.
Actual Test Load Applied : 275 lbs.
Duration of Load : 24 hours.

Results: No damage to the package was found.

4. Penetration Test (49 CFR 173.465 (e) and 173.466 (a)(2))

Weight of Penetration Bar : 13.2 lbs. (6 kg)
Distance from release : 5.5 & 3.3 ft.
Target Area of package : Side panels

Results: Minor indentations were found. Each side panel had indentations measuring approximately 0.25" deep.

173.475 Quality Control Requirements Prior to Each Shipment of Radioactive Materials

Before each shipment of any radioactive materials package, the shipper shall ensure by examination or appropriate tests, that:

- (a) The packaging is proper for the contents to be shipped;**
- (b) The packaging is in unimpaired physical condition, except for superficial marks;**
- (c) Each closure device of the packaging, including any required gasket, is properly installed, secured, and free of defects;**
- (d) For fissile material, each moderator and neutron absorber, if required, is present and in proper condition;**
- (e) Each special instruction for filling, closing, and preparation of the packaging for shipment has been followed;**
- (f) Each closure, valve, or other opening of the containment system through which the radioactive content might escape is properly closed and sealed;**
- (g) Each packaging containing liquid in excess of an A_2 quantity and intended for air shipment has been tested to show that it will not leak under an ambient atmospheric pressure of not more than 0.25 atmosphere, absolute, (0.25 kilograms per square centimeter or 3.6 psia). The test must be conducted on the entire containment system, or on any receptacle or vessel within the containment system, to determine compliance with this requirement.**
- (h) The internal pressure of the containment system will not exceed the design pressure during transportation; and**
- (i) External radiation and contamination levels are within the allowable limits specified in this subchapter.**