Sta # 10

MAY 03 1994

# ENGINEERING DATA TRANSMITTAL

Page 1 of 1

1. EDT 602941

| 2. To: (Receiving Organization) | 3. From: (Originating Organization) | 4. Related EDT No.: |
|---|---|---|
| Distribution | Solid Waste Systems Engineering W23110 | N/A |
| **5. Proj./Prog./Dept./Div.:** | **6. Cog. Engr.:** | **7. Purchase Order No.:** |
| W-026/WRAP 1 | K. J. Leist | N/A |
| **8. Originator Remarks:** | | **9. Equip./Component No.:** |
| For release. | | N/A |
| | | **10. System/Bldg./Facility:** |
| | | 2336-W WRAP-1 |
| **11. Receiver Remarks:** | | **12. Major Assm. Dwg. No.:** |
| | | N/A |
| | | **13. Permit/Permit Application No.:** |
| | | N/A |
| | | **14. Required Response Date:** |
| | | 2/25/94 |

**15. DATA TRANSMITTED**

| (A) Item No. | (B) Document/Drawing No. | (C) Sheet No. | (D) Rev. No. | (E) Title or Description of Data Transmitted | (F) Impact Level | (G) Reason for Transmittal | (H) Originator Disposition | (I) Receiver Disposition |
|---|---|---|---|---|---|---|---|---|
| 1 | WHC-SD-W026-TP-008 | | 0 | Aerosol Can Puncture Device Operational Test Plan | 4 | 1 | | |
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**16. KEY**

| Impact Level (F) | Reason for Transmittal (G) | Disposition (H) & (I) |
|---|---|---|
| 1, 2, 3, or 4 (see MRP 5.43) | 1. Approval 4. Review<br>2. Release 5. Post-Review<br>3. Information 6. Dist. (Receipt Acknow. Required) | 1. Approved 4. Reviewed no/comment<br>2. Approved w/comment 5. Reviewed w/comment<br>3. Disapproved w/comment 6. Receipt acknowledged |

**17. SIGNATURE/DISTRIBUTION** (See Impact Level for required signatures)

| (G) Reason | (H) Disp. | (J) Name | (K) Signature | (L) Date | (M) MSIN | (J) Name | (K) Signature | (L) Date | (M) MSIN | (G) Reason | (H) Disp. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | / | Cog.Eng. KJ Leist | KJ Leist | 2/22/94 | G6-46 | DT Ruff | | | G6-46 | 3 | |
| 1 | / | Cog. Mgr. DE Ball | DE Ball | 2/22/94 | G6-46 | JG Starkey | | | G6-46 | 3 | |
| 3 | | QA JR McGee | | | G6-46 | JM Welsch | | | L6-13 | 3 | |
| | | Safety | | | | Central Files (Original) | | | L8-04 | 3 | |
| | | Env. | | | | WRAP/DMC | | | G6-51 | 3 | |
| 3 | | GL Neer | | | L6-13 | | | | | | |
| 3 | | JB Payne | | | G6-46 | | | | | | |

**18.** KJ Leist — Signature of EDT Originator — Date 2/22/94

**19.** Authorized Representative for Receiving Organization — Date

**20.** DE Ball — Cognizant/Project Engineer's Manager — Date 2/22/94

**21. DOE APPROVAL (if required)** Ltr. No.
- ☐ Approved
- ☐ Approved w/comments
- ☐ Disapproved w/comments

BD-7400-172-2 (07/91) GEF097

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Reference: WHC-CM-3-4

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- [ ] Thesis or Dissertation
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- [ ] Brochure/Flier
- [ ] Software/Database
- [ ] Controlled Document
- [ ] Other

ID Number (include revision, volume, etc.): WHC-SD-W026-TP-008 Rev. 0

List attachments: N/A

Date Release Required: February 11, 1994

Title: Aerosol Can Puncture Device Operational Test Plan

Unclassified Category: UC-N/A

Impact Level: 4

New or novel (patentable) subject matter? [X] No [ ] Yes
If "Yes", has disclosure been submitted by WHC or other company?
[ ] No [ ] Yes Disclosure No(s).

Information received from others in confidence, such as proprietary data, trade secrets, and/or inventions?
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Copyrights? [X] No [ ] Yes
If "Yes", has written permission been granted?
[ ] No [ ] Yes (Attach Permission)

Trademarks?
[ ] No [X] Yes (Identify) Aerosolv®, manufactured by the Justrite Co.

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Title of Conference or Meeting

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Will proceedings be published? [ ] Yes [ ] No
Will material be handed out? [ ] Yes [ ] No

Title of Journal

CHECKLIST FOR SIGNATORIES

| Review Required per WHC-CM-3-4 | Yes | No | Reviewer - Signature Indicates Approval<br>Name (printed) | Signature | Date |
|---|---|---|---|---|---|
| Classification/Unclassified Controlled Nuclear Information | [ ] | [X] | | | |
| Patent - General Counsel | [X] | [ ] | S. W. Berglin | | 3/16/94 |
| Legal - General Counsel | [X] | [ ] | S. W. Berglin | | |
| Applied Technology/Export Controlled Information or International Program | [ ] | [X] | | | |
| WHC Program/Project | [X] | [ ] | J. A. Swenson | | 2/28/94 |
| Communications | [ ] | [X] | | | |
| RL Program/Project | [X] | [ ] | R. E. Bley | | 3/14/94 |
| Publication Services | [X] | [ ] | F. Brey | Public Release Only (Not the Executions) | 4-29-94 CW for FB |
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Information conforms to all applicable requirements. The above information is certified to be correct.

| | Yes | No |
|---|---|---|
| References Available to Intended Audience | [X] | [ ] |
| Transmit to DOE-HQ/Office of Scientific and Technical Information | [X] | [ ] |

Author/Requestor (Printed/Signature) Date

K. J. Leist 2/22/94

Intended Audience

[ ] Internal [ ] Sponsor [X] External

Responsible Manager (Printed/Signature) Date

D. E. Ball 2/22/94

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Date Cancelled

Date Disapproved

# SUPPORTING DOCUMENT

1. Total Pages 13/12

| 2. Title | 3. Number | 4. Rev No. |
|---|---|---|
| Aerosol Can Puncture Device Operational Test Plan | WHC-SD-W026-TP-008 | 0 |

| 5. Key Words | 6. Author |
|---|---|
| Aerosol, Can, Puncture, WRAP, RWM | Name: K. J. Leist<br>Signature<br>Organization/Charge Code 23110/A454A |

7. Abstract

This test plan is to appraise the effectiveness of an aerosol can puncturing system to replace the WRAP 1 baseline concept. This is in response to WHC-SD-W026-ES-011, which recommended that a system based upon a commercially available puncture device be used.

APPROVED FOR PUBLIC RELEASE CW 4-29-94

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9. Impact Level 4

10. RELEASE STAMP

OFFICIAL RELEASE BY WHC (23)
DATE MAY 03 1994
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MASTER

## CONTENTS

# AEROSOL CAN PUNCTURE DEVICE OPERATIONAL TEST PLAN

## 1.0 INTRODUCTION

Puncturing of aerosol cans is performed in the Waste Receiving and Processing Facility Module 1 (WRAP 1) process as a requirement of the waste disposal acceptance criteria for both transuranic (TRU) waste and low-level waste (LLW). Presently, this operation is to be performed within a system custom designed by United Engineers and Constructors (UE&C). These systems, identified as Equipment Tag Numbers 107-XX-07-201 and 401, are shown in the reliability, availability, and maintainability glovebox internal arrangement drawings H-2-131977--LLW and H-2-131974--TRU. The puncturing fixture is found in drawing H-2-132029, while its component details are found in H-2-132030.

Due to Westinghouse Hanford Company (WHC) Fire Protection concerns of the baseline system's fire/explosion proof characteristics, a study, (Leist 1994) was completed. This study compared the baseline system's design to commercially available puncturing devices. While the study found no areas which might indicate a risk of fire or explosion, WHC Fire Protection determined that the puncturing system must have a demonstrated record of safe operation. This could be obtained either by testing the baseline design by an independent laboratory, Underwriter Laboratories, Factory Mutual, or by substituting a commercially available device.

As a result of these efforts, the commercially available Aerosolv can puncturing device (Leist 1994) was chosen to replace the baseline design. This report also initiated the drafting of a Baseline Change Request (Weber 1993), which would replace the current can puncturing design with a system based upon a commercially available one (see the Appendix).

In review of the new system assembly sketch, two concerns were raised. These were:

- Premature blinding of the coalescing/carbon filter, due to its proximity to the puncture and draining operation.
- Overpressurization of the collection bottle due to its small volume and by blinding of the filter assembly.

As a result of these concerns, testing was deemed necessary.

## 2.0 OBJECTIVE

The objective of this test is to assemble the commercially available puncture device-based system, as shown in the Appendix, and perform cycle testing.

As can best be determined, the types and percent presence of aerosol cans expected in the WRAP 1 Facility will be as follows:

| Common Name | Presence | Comments |
|---|---|---|
| Static sprays | 1%? | Used for decon purposes to disperse radon |
| Paint cans | 40% | Used for covering contamination and misc. |
| Electroclean | 10% | Chlorinated solvent |
| Lubricating oil | 10% | Petroleum or silicone base |
| Gasket remover | 5% | Mixture of petroleum distillates, ammonia, alcohol, methylene chloride, etc. |
| Paint remover | 10% | Similar to gasket remover |
| Air freshener | 5% | |
| Oven cleaner | 5% | Chlorinated solvent, ammonia |
| Janitor supplies | 10% | Furniture cleaner, window cleaner, basin and tile cleaner, etc. |
| Insecticides | 5%? | |
| Weld supplies | 1%? | Di-penetrant testing fluid, weld cleaner, etc. |

This can distribution will be used as a guide in the performance of this test.

Issues which will be addressed include:

- Approximate the rate of filter loading.
- Determine the pressures to be endured by the collection bottle as the filter assembly loads up.
- Observe the build-up/coating of system internals.
- Observe the completeness of can draining.
- Observe puncture needle wear.
- Identify and demonstrate solutions to problems which may be discovered during testing.

# 3.0 SCOPE

This testing will be performed in the 305 building. No radioactive materials will be used in this test. This testing will be performed as a workbench demonstration of a system prototype. The final demonstration will be performed in a simulated glovebox environment. The number of cycles to be performed in this demonstration will be as determined by the test engineer.

# 4.0 DESCRIPTION OF TEST

## 4.1 TEST ITEM

The test system is as shown in the Appendix. The system is made up of three components:

- An Aerosolv Model 28202 Aerosol[1] can Puncturing Device, manufactured by the Justrite Manufacturing Co (see the Appendix).
- A combination coalescing/carbon filer Model 28197, also sold by the Justrite Manufacturing Co (see the Appendix).
- A jig to integrate the puncturing device and filter. The jig will also accept a disposable liquid collection bottle.

## 4.2 TEST ENVIRONMENT

Initial tests will be performed as a workbench demonstration.

## 4.3 EQUIPMENT AND FACILITIES

The following items are required to support this test:

- Disposable 1 liter, polyethylene bottles. These bottles must have a 38mm-430 buttress threaded closure.
- Pressure gauge, 0-10 psig. This will be attached to the test item at the threaded port (see the Appendix).
- Pressure relief valve with adjustable pressure limit.
- Aerosol cans. At least 30 cans, of varying sizes, are desired to appraise the system's operating characteristics. The cans' fullness and type of contents should vary.
- Weigh scales, 5 lb minimum capacity, accurate to 1 oz.
- Stop watch.

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[1]Aerosolv is a trademark of Justrite Manufacturing Co.

### 4.4 DATA

The following parameters will be recorded in support of this test:

- Aerosol can contents
- Aerosol can fullness, percent (approximate)
- Aerosol can size, oz
- Peak collection bottle internal pressure, psig
- Draining duration, seconds
- Cans punctured per filter, cumulative
- System internal build-up observations
- Can draining completeness observations
- Can puncture needle dulling observations

### 4.5 CRITERIA/CONSTRAINTS

The Hazardous Materials Coordinator for the 305 Building will be briefed on can puncturing operations.

The collection bottle will be labeled with the aerosol can contents as well as absorbents, if any. The weights of each will also be recorded on the label.

## 5.0 EXPECTED RESULTS

The goals of these tests are as follows:

- Determine the rate at which the filter assembly "loads up."
- Determine if certain aerosol can contents impact filter loading more than others.
- Determine whether the propellant released by the aerosol can excessively pressurizes the collection bottle.
- Determine the effect of absorbents in the collection bottle with aerosol can draining.
- Determine whether buildup of can contents is of concern.
- Determine the system's can draining effectiveness.

- Determine whether the can puncture needle dulling rate is of concern.

## 6.0 TEST PROCEDURE

Prior to testing, both the coalescing and carbon filter must be weighed and its weight recorded. The test fixture is then assembled as in the Appendix. When a filter is thought to be "loaded up", it will be removed from the fixture, reweighed, and its weight recorded.

The typical puncture cycle is as follows:

A. Bottle Preparation

1. Attach label to the liquid collection bottle.

2. Weigh absorbent to be placed in the collection bottle. Record the absorbent type and its weight on the label.

3. Add absorbent to the bottle. Record the bottle (with cap) and absorbent weight.

B. Puncture Cycle

1. Write aerosol can contents onto collection bottle label. Record the can's advertized weight and approximate fullness on the data sheet.

2. Record the collection bottle number, absorbent type, and weight of absorbent on the data sheet. Attach collection bottle to the fixture.

3. Place aerosol can into puncture device. Lock the can retaining plate in place.

4. While viewing pressure gauge, depress and release the puncture device handle. Start the stop watch.

5. Note the peak pressure and record. Stop the stop watch once the pressure gauge has returned to 0 psig.

6. Once can draining is complete, unlock the can retaining plate and remove the aerosol can. Dispose of can as directed by Hazardous Material Coordinator.

7. Remove collection bottle, attach bottle cap, and weigh. Record the new bottle weight on the bottle label.

# 7.0 SAFETY

As protection against overpressurization, the operator must wear safety goggles. A splash guard, made of transparent non-breakable material will also be placed in front of the fixture during testing. The test device will also possess a pressure relief valve. This valve shall be tested prior to testing and will be set at a pressure as to prevent collection bottle rupture.

As flammable materials are being exhibited in this test, all sparking devices, such as motors, and open flames, including lit cigarettes, shall be prohibited in the test area. The size of the "test area" will be TBD.

# 8.0 WASTE MANAGEMENT PLAN

## 8.1 WASTE STREAMS IDENTIFIED

The two waste streams identified from the performance of tests in this plan are the product drained from the aerosol cans and the coalescing filter attached to the puncturing device.

## 8.2 CHARACTERIZATION OF WASTES

The products drained from the aerosol cans shall be characterized by using the Material Safety Data Sheets (MSDS). Only products with MSDS's will be used in testing. As each can is drained the wastes will be collected in separate polyethylene bottles.

The first coalescing filter will be sampled when it becomes waste. The sample results from this filter and the data sheets from testing will be used to established process knowledge for the characterization of other filters. The mobile sampling team will be utilized for the sampling effort.

## 8.3 PACKAGING OF WASTES

The products drained from the aerosol cans will be collected into separate poly bottles which are half full of an appropriate sorbent. Products with the same Hanford MSDS number may be collected in the same container.

The small bottles of product waste will be lab packed into an appropriately labeled satellite collection container. Only products that fall into the same Department of Transportation hazard class may be packaged into the same outer container.

The 305 Building Hazardous Material Specialist (HMS) will instruct the lab technicians performing the work. All poly bottles will be labeled with the contents, hazard class, weight and a package identification number (PIN). The PIN is assigned by the 305 HMS.

The filters will be placed in the 305 regulated rag satellite container.

## 9.0 QUALITY ASSURANCE

No Quality Assurance issues are known for this test.

## 10.0 ORGANIZATION AND FUNCTION RESPONSIBILITIES

The Engineering Testing Facility, Organization Code 22360, will provide hazardous materials disposal coordination and technician support for the completion of this task.

Engineering support will be provided by Solid Waste Systems Engineering (SWSE), Organization Code 23110. SWSE will also be responsible for drafting and issue of a test report when testing is complete.

## 11.0 SCHEDULE

Testing will be complete by February 15, 1994. The test report will be issued by April 1, 1994.

## 12.0 REPORTS

Once testing is complete, results will be summarized in the form of a letter report and transmitted to UE&C for information to support definitive design.

A report, for external release will be drafted at the completion of testing for formal documentation of findings.

## 13.0 DATA SHEET

A sample Data Sheet for recording test data is found in the Appendix.

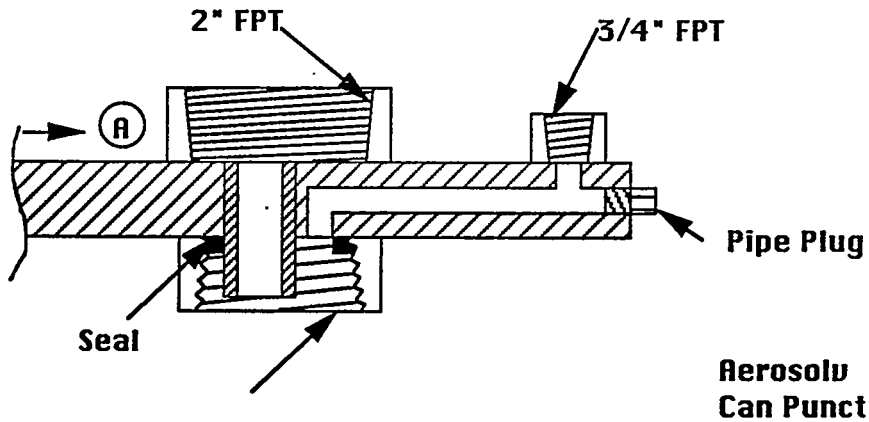
## 14.0 REFERENCES

Leist, K. J., 1994, *Aerosol Can Puncturing Device Evaluation*, WHC-SD-W026-ES-011 REV 0, Westinghouse Hanford Company, Richland, Washington.

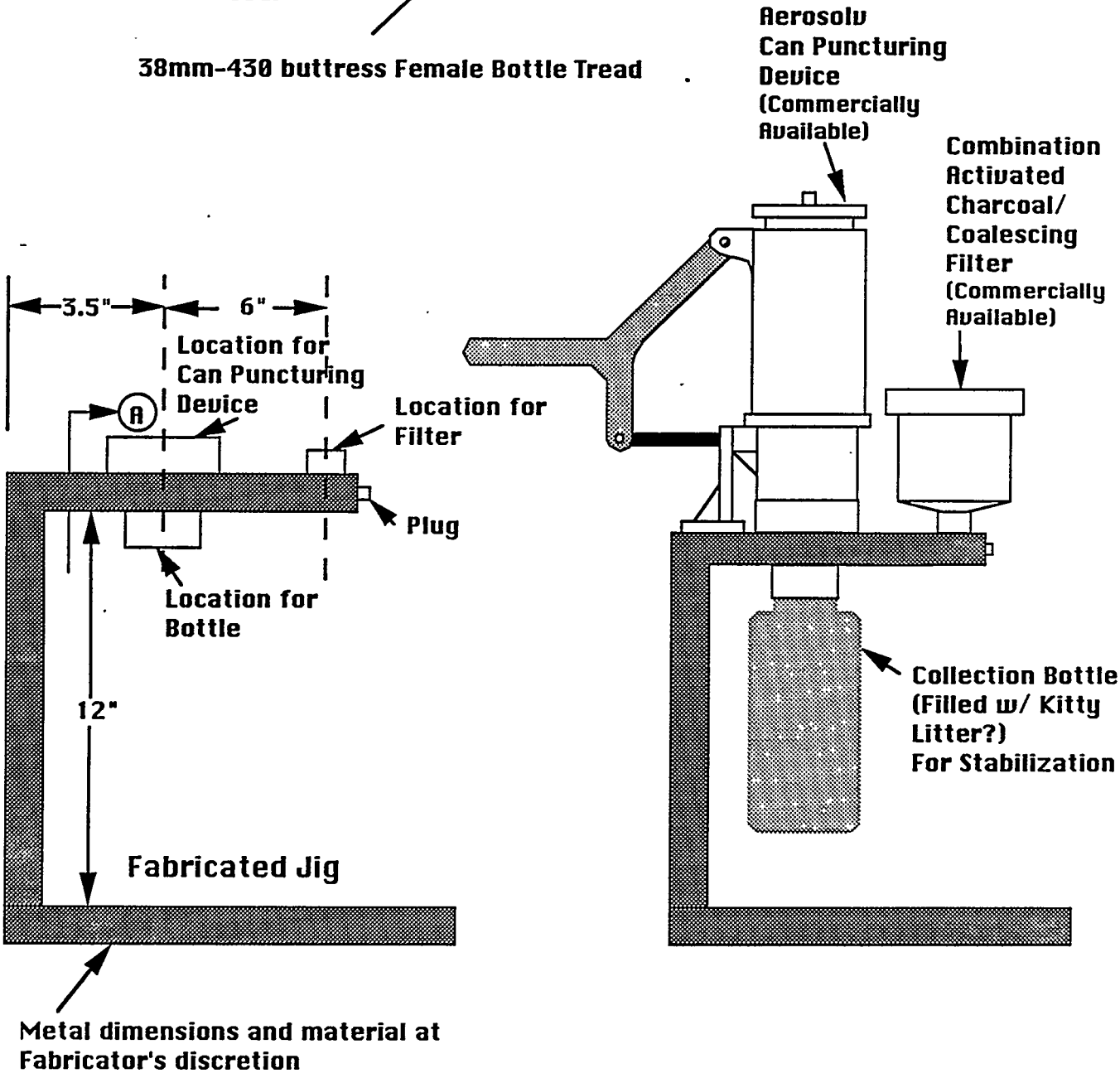
Weber, J. R., 1993, *Revise Drum NDE/NDA Contract Strategy & Technical Spec.*, Baseline Change Request, W-026-080, Westinghouse Hanford Company, Richland, Washington.

# APPENDIX

# Proposed Aerosol Can Puncture System




38mm-430 buttress Female Bottle Tread




Metal dimensions and material at Fabricator's discretion

Sample Data Sheet

| Can # | Can Advertised Contents | Advertised Net Wt, oz. | Can, % Full | Collection Bottle No. | Absorbent, Weight | Peak Pressure | Pressure Duration |
|---|---|---|---|---|---|---|---|
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