3875 WI.0-02-1 WI.0-02 1.21.1

MEMORANDUM

TO: FILE DATE 12/9/87

FROM: A. Wallo

SUBJECT:

SITE NAME: TRANE Company ALTERNATE NAME:

CITY: LaCross STATE: WI

OWNER(S)
Past: TRANE Current:
Owner contacted ☐ yes ☒ no; if yes, date contacted

TYPE OF OPERATION
☐ Research & Development
- ☐ Production scale testing
- ☒ Pilot Scale
- ☐ Bench Scale Process
- ☐ Theoretical Studies
- ☐ Sample & Analysis

☐ Facility Type
- ☐ Manufacturing
- ☐ University
- ☐ Research Organization
- ☐ Government Sponsored Facility
- ☐ Other

☐ Production
☐ Disposal/Storage

TYPE OF CONTRACT
- ☐ Prime
- ☐ Subcontractor
- ☐ Purchase Order

☐ Other information (i.e., cost + fixed fee, unit price, time & material, etc)

Contract/Purchase Order # ANL (MET LAB) Sub Contractor

CONTRACTING PERIOD:

OWNERSHIP:

	AEC/MED OWNED	AEC/MED LEASED	GOVT OWNED	GOVT LEASED	CONTRACTOR OWNED	CONTRACTOR LEASED
LANDS	☐	☐	☐	☐	☒	☐
BUILDINGS	☐	☐	☐	☐	☒	☐
EQUIPMENT	☐	☐	☐	☐	☒	☐
ORE OR RAW MATL	☐	☐	☐	☐	☐	☐
FINAL PRODUCT	☐	☐	☐	☐	☐	☐
WASTE & RESIDUE	☐	☐	☐	☐	☐	☐

AEC/MED INVOLVEMENT AT SITE

Control N/A

- ☐ AEC/MED managed operations
- ☐ AEC/MED responsible for accountability
- ☐ AEC/MED overviewed operations
- ☐ Contractor had total control
- ☐ unknown

☐ Health Physics Protection

- ☐ Little or None
- ☐ AEC/MED responsibility
- ☐ Contractor responsibility

MATERIALS HANDLED:

Type (on basis of records reviewed)

- ☒ No Radioactive
- ☐ Natural Radioactive from Feed Materials Production
  - ☐ Ore
  - ☐ Refined Source Material
  - ☐ Residue
- ☐ Natural Radioactive Material from Non-Nuclear Activities
- ☐ Man-Made
- ☐ Other _____

Comment Company Produced Aluminum Cans for Such and experiments at The MET LAB

Quantities (on the basis of records reviewed)

- ☒ None
- ☐ Production Quantities
- ☐ Small Amounts

Comment No record of Any Uranium work

OTHER PERTINENT FACTS:

☐ Facility was Licensed

- ☐ During AEC/MED-Related Operations
- ☐ For Similar Activities
- ☐ For Other Activities

Comment _____

☐ Commercial Production Involving Radioactive Material during AEC/MED Operations

☐ Facility was Decontaminated and Released

☐ Availability of Close Out Records

☒ None ☐ Some ☐ Sufficient

☐ Radioactive Status:

	YES	MAYBE	PROBABLY NOT	NOT
Contaminated	___	___	___	X
Potential for Exposure (accessible)	___	___	___	X

QUANTITY OF RECORDS AVAILABLE:

☒ Very Little ☐ Some ☐ Sufficient

PROBABILITY OF FINDING ADDITIONAL RECORDS:

☒ Low ☐ Possible ☐ High

RECOMMENDATIONS:

☒ Eliminate
☐ Consider for Remedial Action
☐ Collect More Data

Comment There is No indication this site handled Radioactive Material For the AEC

REFERENCES:

A Hachet

SUMMARY TRANE Also supplied construction materials to Oak Ridge under Contract AT 40-1-1369 (No Radioactive material) (early 1950's

11/25/87

TRANE CO.

DATE	FILE#	FROM	TO	SUBJECT	SITES	BOX #	
12/24/43	3.1CHD	COLLINS, P.	JONES, K.	CAN BASE THICKNESSES	TRANE CO., PAUL & BEEKMAN	MLRF	557
02/05/44	3.1CHD	SNELL, G.	HAINES, E.	PROCESS FOR MANUFACTURE OF 35 MIL ALUMINUM CANS	TRANE COMPANY, LaCROSS, WI	MLRF	604

RESTRICTED

Copy

December 24, 1943

K. G. Jones

P. E. Collins

Can Base Thicknesses

CLASSIFICATION CHANGED
TO: NOT CLASSIFIED
NOV 7 1969 E. N. Probst
Authority of: USAEC
NOV 19 1969

As you have probably noticed, reports on gauge measurements of cans in the past have omitted can base thicknesses. At the time these reports were submitted, it seemed inadvisable to measure base thickness since the majority of them had to undergo subsequent sizing operations at Site B. The following measurements have been obtained by sectioning some cans in each of the lots received and taking micrometer measurements for these dimensions.

15 Mil Cans from Trans Company	
Average base thickness	46.5 Mils
Paul & Beekman Outside Cans	
(Before sizing)	38.7 "
Paul & Beekman Outside Cans	
(After sizing)	38.2 "

In the future, all gauge reports on cans will include the bottom thickness measurement since a mandrel is now being made which will enable very accurate measurements to be taken with our present gauges.

Paul E. Collins

Paul E. Collins

PEC:lm

cc: A.B.Greninger
J.B.Miles
Chipman-Cooper
Reading File
J.P.Howe

This document contains information affecting the national defense of the United States within the meaning of the Espionage Act, U. S. C. 50: 31 and 32. Its transmission or the revelation of its contents in any manner to an unauthorized person is prohibited by law.

~~RESTRICTED~~ Copy

~~RESTRICTED~~

TO: E. B. Haines

February 5, 1944

FROM: J. A. Small

RE: Process for Manufacture of 35 Mil Aluminum Cans

The following process has been developed in conjunction with the Trane Company of LaCrosse, Wisconsin and has been used successfully in producing about 500 cans. However, certain minor changes are necessary in order to hold the tolerances desired, that is, plus or minus .001" on outside diameter and plus or minus .0005" on wall thickness. Changes are necessary because the process was developed from tools already made for a 30 mil and a 15 mil can.

The process consists mainly of six cupping operations and two re-drawing operations. In cupping operations no reductions in wall thickness are effected, while the diameter is reduced. In re-drawing operations wall thickness is reduced along with a very minor reduction in diameter. Operations are as follows:

(1) Blank Disc - This operation consists of shearing a round blank from standard rolled sheet stock .051" thick. Blanking die diameter 6.250". Blanking punch diameter 6.250", (must be fit to die.)

(2) 1st Cup - This operation consists of forming the blank disc into a cup of 3.500" outside diameter by about 1.9" long. This is accomplished through the use of a post or very short punch and a special die. A pressure pad is required so that the material will not wrinkle during cupping and, therefore, the post is usually mounted on the bolster plate of the press since the pressure pad is most easily mounted below the bolster plate. Correspondingly the die is mounted in the cross head or ram and operates against the pressure pad. Many different types of set up are possible, depending upon the press to be used for this operation. Diameter of die 3.500". Diameter of punch, or post 3.400".

CLASSIFICATION CANCELLED
FEB 27 1969
For the Atomic Energy Commission
ROBERT L. JACKSON
Chief, Declassification Branch

ucing the outside diameter from 3.5" approximately 2.6". Diameter of die tion in diameter is 14%.

(1) ucing the outside diameter from 2.9" approximately 2.4". Diameter of die tion in diameter is 17%.

co. ucing the outside diameter from 2.5" trim length of approximately 4.3". Diameter to a 6. Reduction in diameter is 20%.

(2) We should ucing the outside diameter from 2.062" to improve length of approximately 5.75". in wall thickn the punch 1.525". Reduction in

(3) Even up the work ucing the outside diameter from 1.625" percent reduction fr length of approximately 6.3". Diameter the 4th cup the percen 1.384". Reduction in diameter is reduction is only 8%. b reduction is approximately be kept to a minimum.

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TO: E. B. Haines

February 5, 1944

FROM: G. A. Snell

RE: Process for Manufacture of 35 Mil Aluminum Cans

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(3) 2nd Cup - This operation consists of reducing the outside diameter from 3.5" to 3.0" giving a new cup with a length of approximately 2.6". Diameter of die 3.000". Diameter of punch 2.899". Reduction in diameter is 14%.

(4) 3rd Cup - This operation consists of reducing the outside diameter from 3.0" to 2.5" giving a new cup with a length of approximately 3.4". Diameter of die 2.500". Diameter of punch 2.400". Reduction in diameter is 17%.

(5) 4th Cup - This operation consists of reducing the outside diameter from 2.5" to 2.062" giving another new cup with a length of approximately 4.3". Diameter of die 2.062". Diameter of punch 1.962". Reduction in diameter is 20%.

(6) 5th Cup - This operation consists of reducing the outside diameter from 2.062" to 1.625" giving another new cup with a length of approximately 5.75". Diameter of the die 1.625". Diameter of the punch 1.525". Reduction in diameter is 21%.

(7) 6th Cup - This operation consists of reducing the outside diameter from 1.625" to 1.484" giving another new cup with a length of approximately 6.8". Diameter of the die 1.484". Diameter of the punch 1.384". Reduction in diameter is 9%.

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(8) Wash - This operation consists of hand washing the cups in hot water to remove stripping chips or any foreign matter that may have accumulated. This is necessary from a quality standpoint, since such material contaminates dies, causes excessive loading and spoils the finish of the final can.

(9) 1st Re-draw - This operation consists of reducing the wall thickness by .005" and the outside diameter by .017" giving a can with a wall thickness of approximately .045" and approximately 7.5" long. Diameter of the die 1.467". Diameter of the punch 1.377". Reduction in wall thickness is 10%.

(10) 2nd Re-draw - This operation consists of reducing the wall thickness of the can by .010" and the outside diameter by .027" giving a final can with an outside diameter of 1.440" and a wall thickness of .035" and a length of 9.75". Diameter of the die 1.4415". Diameter of the punch 1.470". It is to be noted that on this final drawing operation the diameter of the die is approximately .001" over the final size of the finished can. This is necessary because in the drawing operation the punch expands from heating and the cans are also heated during the drawing operation and contract back to 1.440" after cooling. Reduction in wall thickness is 22%.

(11) Trim - This operation consists of trimming the can to the desired length by rotating the can (mounted on an arbor) in contact with a set of rotary cutters. Final length is 8.75".

(12) Flatten the End - This operation consists of squaring up the end of the can and removing the radius left in the corner of the bottom by the final draw punch. This is accomplished through the use of a special forming die and punch, each having a very small corner radius. It is possible to extrude the end of the can by this method and force material from the end into the side walls so that any desired thickness of bottom can be obtained. This is called "coining". Diameter of die 1.441". Diameter of the punch 1.363".

In general, cans produced with this method were satisfactory, although there was considerable variation in wall thickness of the final can. This variation was not too serious; however, considerable improvement in quality can be effected by making several minor changes in the process as follows:

(1) We should use .064" standard rolled stock instead of .051" and make the corresponding changes in punches and dies. This will allow more stock for trimming, provide for more even draws and enable us to hold the wall thickness to a closer tolerance.

(2) We should add a very small amount of drawing on each cupping operation in order to improve the variation in wall thickness. Approximately .001" reduction in wall thickness will be desirable for each cupping operation.

(3) Even up the work done during each cupping operation. It is noticed that the percent reduction from the 1st to the 2nd cup is 14%, whereas on the 3rd to the 4th cup the percent reduction is 20% and on the 5th to the 6th cup the reduction is only 9%. By smoothing out these operations so that the percent reduction is approximately equal, cold working strains present in the cup can be kept to a minimum.

(4) In order to improve the finish, it will be very desirable to include several washing operations to remove all chips and foreign matter. The material is covered with lubricant after each operation and picks up dirt very easily which contaminates dies on the next operation and spoils the finish of the can.

(5) It will also be desirable to include an extra trimming operation after the first re-draw. In ever case of re-drawing, the wall thickness of the drawn can will vary considerably at the very end of the draw, while it will not vary so much 1" to 2" from the end of the can. This trimming operation will help stabilize final wall thickness of the finished can.

(6) We should re-distribute the amount of reduction on the drawing operations so that the major part of the total reduction is done on the first re-draw. In the present process, the first reduction in wall thickness is only .005", whereas the reduction in the final re-draw is .010". The final wall thickness will be more easily stabilized if the percent of reduction in this case were reversed.

The final process then should be as follows:

(1) Blank Disc - This operation will be the same as before and will consist of shearing a round blank from standard rolled sheet stock .064" thick, 6.250" diameter. Punches and dies will be the same.

(2) 1st Cup - This operation will consist of forming the blank disc into a cup 3.500" in outside diameter by approximately 2" long. Diameter of the die 3.500". Diameter of the post 3.375".

(3) 2nd Cup - This operation will consist of reducing the outside diameter from 3.5" to 3.0", and the wall thickness from .064" to .063", giving a new cup with a length of approximately 2.7". Diameter of the die 3.000". Diameter of the punch 2.874". Reduction in diameter is 14%.

(4) 3rd Cup - This operation consists of reducing the outside diameter from 3.00" to 2.530" and the wall thickness from .063" to .062" giving a new cup approximately 3.5" long. Diameter of the die 2.530". Diameter of the punch 2.406". Reduction in diameter is 15%.

(5) 4th Cup - This operation consists of reducing the outside diameter from 2.530" to 2.130" and reducing the wall thickness from .062" to .061" giving a new cup with a length of approximately 4.6". Diameter of the die 2.130". Diameter of the punch 2.008". Reduction in diameter is 16%.

(6) 5th Cup - This operation consists of reducing the outside diameter from 2.130" to 1.790" and reducing the wall thickness from .061" to .060" giving a new cup approximately 5.75" long. Diameter of the die 1.790". Diameter of the punch 1.670". Reduction in diameter is 16%.

(7) 6th Cup - This operation will consist of reducing the outside diameter from 1.790" to 1.510" and reducing the wall thickness from .060" to .059" giving a new cup approximately 6.9" long. The diameter of the die 1.510". Diameter of the punch 1.392". Reduction in diameter is 16%.

(8) Wash - This operation will be the same as before, using hot soapy water.

(9) 1st Re-draw - This operation consists of reducing the wall thickness of the cup from .059" to .043" giving a can approximately 9.75" long. Diameter of the die 1.467". Diameter of the punch 1.381". Reduction in wall thickness is 27%.

(10) Trim - This will be the same as the other trimming operations and will consist of trimming the can to approximately 8.5" in length.

(11) Wash - This will be the same as the previous washing operations and is necessary to maintain quality of the finish on the final can.

(12) Final Re-draw - This operation will consist of reducing the wall thickness of the can from .043" to .035" and reducing the outside diameter to 1.440" and will give a new can approximately 10.5" long. Diameter of the die 1.4415". Diameter of the punch 1.4705". Reduction in wall thickness is 9%.

(13) Trim - This operation will be the same as previous trimming operations and will consist of trimming the can to 8.75" in length.

(14) Flatten the End - This operation will be the same as before.

The process outlined above will produce satisfactory cans with tolerances of plus or minus .001" on the outside diameter and plus or minus .0005" on the wall thickness. This process is recommended for the future if any large quantity of cans is to be manufactured. However, for experimental purposes the present process is satisfactory and the cost of new punches and dies probably would not be justified.

Inspection of the cans recently manufactured indicates that it would be quite desirable to provide an annealing operation after the 5th or 6th cup to relieve cold working strains produced by the cupping operations. However, it is quite possible that this will not be necessary with the new cupping operations proposed. Some experimental work should be done along these lines, however.

During the manufacturing process, the following points should be kept in mind:

Punches must be set up perfectly straight and at right angles to the bed plate of the press and must be perfectly centered with respect to the dies.
Dies must be kept very sharp and very clean. Sharpness is necessary in order to strip the cans from the punches, while it is necessary to keep them clean to prevent aluminum chips from piling up on the drawing land.
Cups and cans must be kept very clean as they are fed into the cupping and drawing operations. This is necessary to keep die loading at a minimum, and to maintain the finish of the can. If facilities are available, it is recommended that material be washed preceding each operation.
Plenty of lubricating oil must be provided for each operation, particularly the drawing operations. Lubricant should be SAE #10 oil mixed with 25% to 50% lard oil, or on cupping operations, straight lard oil may be used.
On the final re-draw the punch should be cooled, if possible, and in any event, maintained at a fairly constant temperature in order to control the diameter and wall thickness of the cans.

It is generally necessary to fit the final die to the final punch under actual operating conditions to obtain the correct size of diameter and wall thickness.

Punch Design

The punches should be made of good quality tool steel similar to Ketos or Stentor and should be hardened to Rockwell 58-61 C on the working end, but should be drawn to a Rockwell 40-45 C on the shank. The shank should be threaded concentric to the outside diameter of the punch which should be provided with a taper of .001" per foot of length in order to facilitate stripping. Also an air relief hole should be drilled completely through the center line of the punch in order to provide relief for stripping. A radius must be provided on the drawing end of the punch to facilitate the flow of the metal on both cupping and drawing operations. This is very important and the radius must blend perfectly with both the side and bottom of the punch to avoid deforming the end of the can during drawing. In general, the minimum length of the punch will be the length of the cup or can formed, plus 2" for die clearance. However, it is well to provide additional length and this is best computed by fitting the punch length to the press where it is to be used.

Die Design

Two types of dies are used:

A. Cupping Dies - Cupping dies have two sections. The top section is made to fit the cup from the previous operation for centering purposes. The bottom section is for the cupping operation itself and is joined to the top section with a radius to facilitate the flow of metal and it is very important also that the radius blend to the side walls of both sections of the die. The bottom edge of the die must be ground to a very sharp edge to strip the cup from the punch on the return stroke. Cupping dies are held rigidly in position under the punch.

B. Re-drawing Dies - Re-drawing dies are made in one section similar to the bottom section of the cupping die with a radius from the top surface to the side wall of the die to facilitate the flow of metal. These dies must be also ground on the bottom edge to provide stripping edges but are allowed to "float" during the drawing process. In general, external dimensions of the tools must be designed to fit the particular press where they are to be used.

If the above points are kept in mind along with the proposed process, we feel that entirely satisfactory cans can be manufactured on a production basis.

George A Snell

George A. Snell

GAS:lm

Savannah River 3.9

OFFICIAL USE ONLY

Box 431

MEMORANDUM

TO : Heads of Divisions and Managers of Operations DATE: December 6, 1954

FROM : John A. Derry, ~~Director~~ for J. A. D.
Division of Construction and Supply, Washington

SUBJECT : AEC CONTRACTS OVER $1,000,000 - ACTIVE SEPTEMBER 30, 1954

SYMBOL : CSCE-R:HGH

The attached tabulation of active AEC contracts over $1,000,000 has been prepared as a result of recurring requests for information on our larger contracts. It consists of Part I - Prime Contracts and Part II - Subcontracts, and lists the contracts alphabetically by Operations Office to show; (1) type of work being performed by the contractor; (2) contract number; (3) accumulated dollar obligation; (4) type of contract, i.e., cost type or fixed price; and, (5) the estimated completion date.

Information for this report was taken from field reports submitted pursuant to Chapter 9127 of the AEC Manual. This chapter provides for reporting on all types of contracts except those for acquisition of land and source materials. It further provides that all AEC contracts will be cataloged into the following seven categories:

1. Architect-Engineer (AE)
2. On-Site Construction
3. Research and Development (R&D)
4. Materials, Supplies and Equipment for Construction (MSE-Cons.)
5. Materials, Supplies and Equipment, Other (MSE-Other)
6. Rents and Utility Services
7. Other Services

Due to the difficulty of accurately estimating completion dates, this report lists contracts which were due to have been completed during the last three months. The word "open" used in the completion column indicates that no completion date has been specified by the field.

The Division of Construction and Supply will furnish additional copies of this tabulation on request.

OFFICIAL USE ONLY

Operations Office	Name and Address of Contractor	Type of Work	Contract Number	Accumulated Obligation	Type of Contract	Est. Comp. Date
Oak Ridge (Cont'd)	A. O. Smith Corp., Milwaukee, Wis.	MSE(Cons.)	AT(40-1)-1652	$ 3,836,629	FP	Open
	Southern Railway Co., Washington, D. C.	Other Serv.	W-28-094 Eng 47	1,586,198	CT	"
	Taylor Forge & Pipe Works, Chicago, Illinois	MSE(Cons.)	AT(40-1)-1545	7,191,257	FP	"
	Taylor Instrument Co., Rochester, N. Y.	" "	AT(40-1)-1525	11,569,585	"	"
	University of Tennessee, Knoxville, Tenn.	R&D	AT(40-1)-Gen 242	2,106,114	CT	"
*	The Trane Co., La Crosse, Wis.	MSE(Cons.)	AT(40-1)-1369	5,237,700	FP	"
	Union Carbide & Carbon Corp. (Carbide & Carbon Chem. Div.) New York, New York	Rents & Utils.& Oper.	W-7405-Eng 26	1,190,651,129	"	"
	Vitro Corp. of America, New York, N. Y.	A-E	AT(40-1)-1329	3,388,959	CT	"
	Westinghouse Electric Corp., Cincinnati, Ohio	MSE(Cons.)	AT(40-1)-1514	3,263,117	FP	8/31/54
	York Corporation, York, Pennsylvania	" "	AT(40-1)-1538	8,550,376	"	Open
San Francisco	The Regents of the Univ. of Calif., Berkeley, California	R&D & Operating	W-7405-Eng 48	146,506,488	CT	6/30/57
	California Inst. of Technology, Pasadena, Cal.	R&D	AT(11-1)-68	2,495,000	"	6/30/55
	California Research & Development, San Francisco, California	"	AT(11-1)-74	43,706,998	"	Open
	North American Aviation, Los Angeles, Calif.	R&D	AT(11-1)-Gen 8	12,846,646	"	6/30/56
	" " " " " "	"	AT(04-3)-49	3,450,000	"	6/30/55
	Radio Corp. of America, Harrison, N.J.	R&D	AT(11-1)-143	3,126,429	"	12/31/54
Santa Fe	American Car & Foundry Co., New York, N.Y.	Other Serv.	AT(29-2)-1352	12,284,839	"	12/31/54
	Air Force, Wright Air Dev. Center, Ohio	MSE(Other)	ST 54-689	2,750,000	FP	4/30/55

PART II

ACTIVE SUBCONTRACTS OVER $1,000,000 - SEPTEMBER 30, 1954

Operations Office	Name and Address of Subcontractor	Type of Work	Subcontract Number	Accumulated Obligation	Type of Contract	Est. Comp. Date
Chicago	Electric Boat Div., General Dynamics Corp. Groton, Connecticut	R&D	AT-11-1-Gen 14 14-301	$ 7,936,179	CT	4/30/55
Hanford	Foothill Electric Company, Oakland, Calif.	Construction	AT(45-1)-638 KE-5234-1	5,089,717	"	Open
	Electric Boat Div., General Dynamics Corp. Groton, Connecticut	MSE (Cons.)	AT(45-1)-664 BKC-4100-1560	1,147,929	FP	10/1/54
	Jaggar, Sroufe, Lord, Elec. Inc., Hanford, Washington	Construction	" F-3	2,689,000	CT	12/31/54
	Pittsburgh-Des Moines Steel Co., Seattle, Washington	"	AT(45-1)-638 KE-5234-12	1,129,843	FP	10/1/54
	Steel Construction Company, Portland, Ore.	A-E	AT(45-1)-638 KE-5234-6	1,903,079	"	8/1/54
	Urban Engineering Company, Tacoma, Wash.	Construction	AT(45-1)-687 J-1	3,450,000	CT	6/1/55
New York	Birdsboro Steel Foundry & Mach. Company, Birdsboro, Pennsylvania	MSE (Other)	AT(30-1)-1060 AEC 3000-75	3,399,173	"	Open
Oak Ridge	Allied Chem. & Dye Corp., General Chem Div., New York, N.Y.	" "	W-7405-Eng 26 W40K-75702	1,352,900	FP	6/30/55
	Allis Chalmers Mfg. Co., Memphis, Tenn.	MSE (Cons.)	AT(15-1)-2 762-3709	3,156,610	"	10/1/54
	" " " " " "	" "	AT(40-1)-1400 MSC-205A	4,337,527	"	10/1/54
	" " " " " "	" "	AT(15-1)-2 762-3161	1,452,259	"	Open