



U.S. Department
of Transportation

**Research and
Special Programs
Administration**

400 Seventh Street, S.W.
Washington, D.C. 20590

APR 27 2001

Ms. Carol Bonner
Norcold
1 Century Drive
Gettysburg, OH 45328

Ref. No. 01-0075

Dear Ms. Bonner:

This responds to your March 1, 2001 letter requesting clarification on the proper description of your refrigeration cooling units under the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180). Specifically, you ask whether you have properly described the refrigeration cooling units and whether the exception under § 173.307(a)(4)(ii) applies.

According to your letter and follow-up telephone conversations with Deborah Boothe of my staff, Norcold produces absorption refrigeration units for the recreational vehicle industry. Each of the cooling units contain ammonia solution, with the largest unit containing 1,250 milliliters of solution. The gross weight of the largest unit is 67 pounds. The pressure in the cooling unit is between 350-400 psig. Hydrogen is used as a charging agent or dispersant gas to disperse the ammonia solution in the cooling unit. The residual hydrogen, which remains in the cooling unit with the ammonia solution after charging, only amounts to about 12 grams or less for the largest unit manufactured.

Based on the information provided, it is the opinion of this Office that the exception provided in § 173.307(a)(4)(ii) applies to the refrigerating machines and its components (cooling units) manufactured by your company. Therefore, the refrigerating machines and the components (cooling units) are not subject to the HMR.

I hope this answers your inquiry.

Sincerely,



John A. Gale

Transportation Regulations Specialist
Office of Hazardous Materials Standards



Boothe
§ 173.307(a)(4)
Applicability
01-0075

March 1, 2001

Department of Transportation
Research and Special Programs
Office of Hazardous Materials Standards
Washington DC

RE: Norcold Inc./DOT Labeling Requirement

To Whom It May Concern:

Norcold wants clarity and verification that we have taken the right approach in evaluating

1. The proper DOT classification for our refrigerating machines and
2. The lack of need for a "flammable gas" label for packaging and marking.

Norcold is a manufacturing facility that produces absorption refrigeration units for the R.V. industry. As part of the process, the cooling units, which are eventually attached to the refrigerator box, are manufactured in Gettysburg, Ohio. These units are treated as refrigerating machines. The refrigerators are put together at another Norcold facility located in Sidney, Ohio. There are two levels of transportation: 1) from Gettysburg to Sidney (cooling units), and 2) from Sidney to distributors (refrigerators). Each of the cooling units contains ammonia solution, with the largest unit containing 1,250 milliliters of solution.

Hydrogen is used as a charging agent or dispersant gas, to disperse the ammonia solution in the cooling unit. The residual hydrogen, which remains in the cooling unit with the ammonia solution after charging, only amounts to about 12 grams or less for the largest unit manufactured.

In making the determination of the DOT classification, the following was considered:

- The residual hydrogen is NOT pure because it is mixed with the ammonia solution
- The residual hydrogen is dissolved in the ammonia solution and/or mixed with the ammonia vapors; the resulting mixture is both liquid and vapor.
- The resulting liquid/vapor mixture is NOT a flammable gas or flammable liquid, by definition of 8173.115(a) and 8173.120(a)
- The hydrogen is NOT located in a container (tubing) holding hydrogen ONLY; the hydrogen is located in the SAME container (tubing) as the ammonia solution

Thus, for the purpose of DOT classification, the hydrogen is considered part of the ammonia solution or "refrigerant". In addition, Norcold believes that pursuant to 49 CFR 8173.307(a)(4)(ii), our refrigerating machines are excepted and/or exempt from all of the DOT Hazardous Material shipping requirements, including labeling, marking, and placarding, because our refrigerating machines and/or components (cooling units) contain less than 3 gallons of ammonia solution (UN2672). Thus, there is no need for any labels or markings.

Please respond as soon as possible. Thank you for your help in this matter.

Sincerely,

Carol Bonner

Carol Bonner
Environmental Health and Safety Coordinator

cc: file

Regional
23668 Cooper Drive
Elkhart, IN 46515
Phone: 219-266-6660
Fax: 219-266-5779

Headquarters
600 S. Kuther Road
P.O. Box 180
Sidney, OH 45365
Phone: 937-497-3080
General Fax: 937-497-3085
Administrative Fax: 937-497-3167

Gettysburg
1 Century Drive
Gettysburg, OH 45328
Phone: 937-447-2241
Fax: 937-497-3074

please mail or fax response to:

pressure 519 = 350-400
gross wt = 67 lbs. 519
shipped in spec packaging
wooden box
Crutcher



~~Booth~~
~~§173.306(e)~~
~~Applicability~~

April 2, 2001

Ms. Deborah Booth
Department of Transportation
Research and Special Programs
Office of Hazardous Materials Standards
Washington DC

RE: Norcold Inc./DOT Labeling Requirement

Dear Ms. Booth:

This letter is in response to your request for additional information regarding the shipping of refrigeration units manufactured at Norcold.

The units manufactured at Norcold meet the requirements defined in 49 CFR 8173.306(e).

- The largest units do not contain more than 50 pounds of refrigerant (8173.306(e)(i))
- All of the units have only one charge vessel (8173.306(e)(ii))
- All of the units are equipped with a safety device that meet ANSI requirements (8173.306(e)(iii))
- The units have a fuse tube as a safety device, thus there is no applicability for a shut-off valve (8173.306(e)(iv))
- The units are manufactured and inspected/tested in accordance with ANSI Standards (8173.306(e)(v-vi))
- The liquid portion of the refrigerant does not completely fill the pressure vessel and does not exceed the filling density (8173.306(e)(vii ~ viii))

The following addresses the questions and/or additional information requested to complete your evaluation.

1. How are the cooling units shipped to Sidney?

The units are packed in DOT approved steel crates, and/or DOT approved wooden crates (see attached DOT packaging certifications and pictures). However, Norcold is excepted from the packaging requirements via 49 CFR

Regional
23666 Cooper Drive
Elkhart, IN 46515
Phone: 219-268-6660
Fax: 219-268-5779

Headquarters
800 S. Kuther Road
P.O. Box 180
Sidney, OH 45365
Phone: 937-497-3080
General Fax: 937-497-3085
Administrative Fax: 937-497-3167

Gettysburg
1 Century Drive
Gettysburg, OH 45328
Phone: 937-447-2241
Fax: 937-497-3074

Debbie,

4/3/01

Here is the additional
information you requested
from Norcold. It was
was not logged in as
an additional interp.

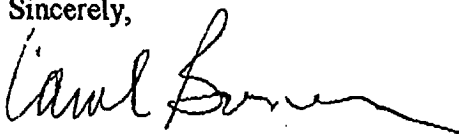
CD

Page 2
DOT

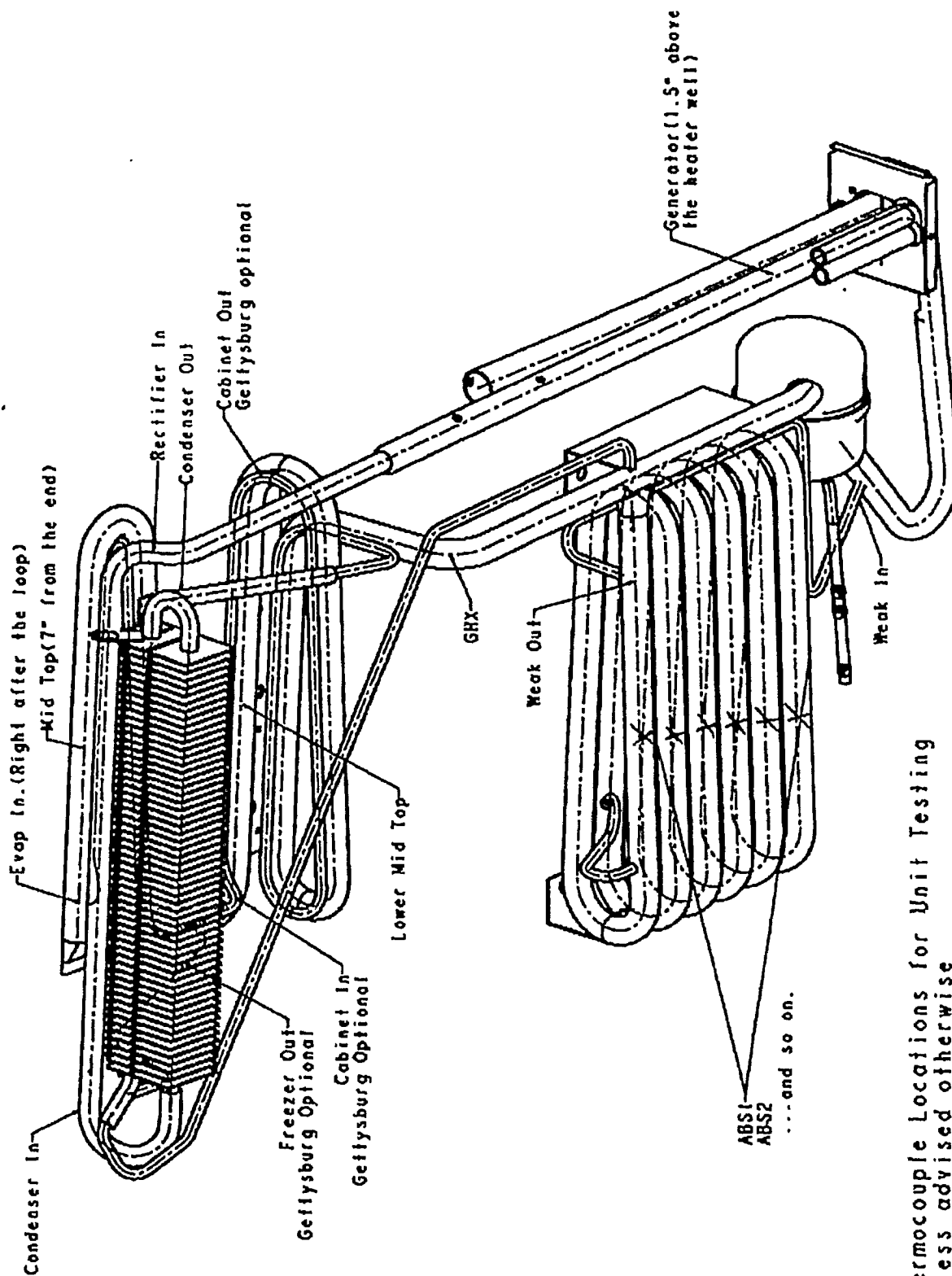
§173.306(e). The crates are currently labeled with a flammable gas label (Norcold believes that it is NOT required. Prior management thought it was better to "over label" when not sure). The units are then loaded onto a DOT licensed and permitted Norcold transport vehicle. Corrosion placards are placed on all four sides when loaded. Shipping papers are completed (see attached) and sent with the load to Sidney.

If there are additional questions, please feel free to call.

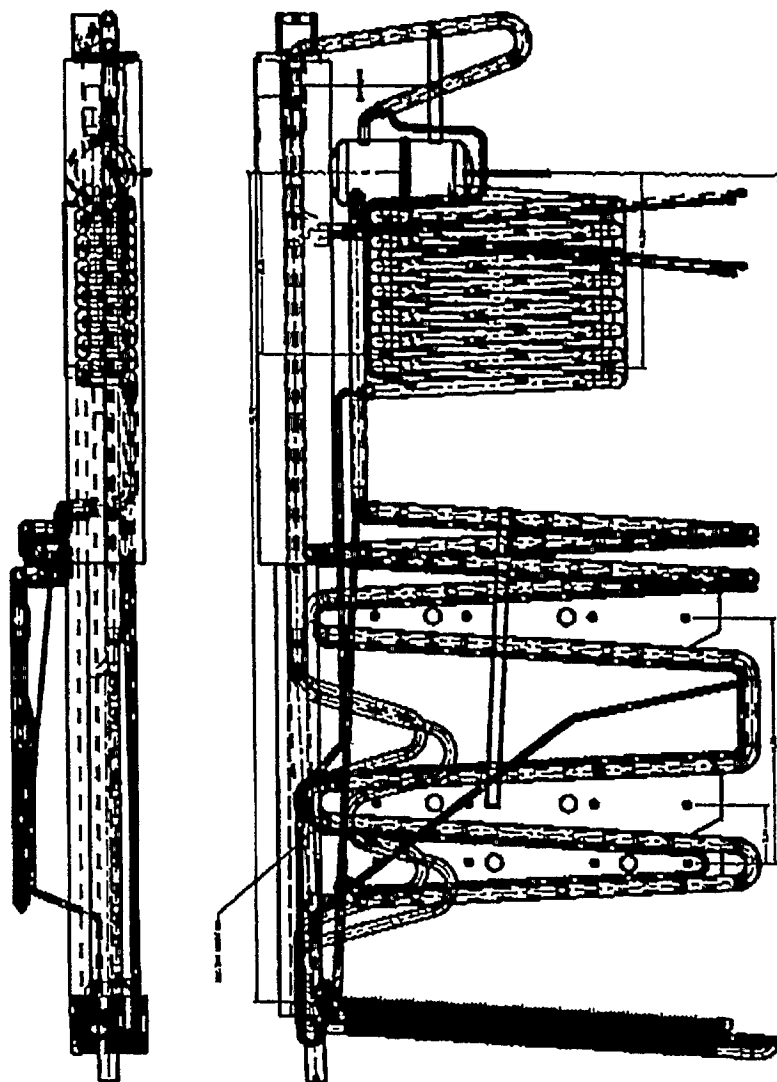
Sincerely,



Carol Bonner
Environmental Health and Safety Coordinator



Thermocouple Locations for Unit Testing
Unless advised otherwise



IMPORTANT INFORMATION

Before replacing the cooling system, read this bulletin. It outlines important procedures which must be followed during the cooling unit replacement.

STEP 1 identifies those models which may require trimming the foam block. If required, trimming instructions are included.

STEP 2 outlines proper (and necessary) application of transfer mastic and permagum sealing.

STEP 3 outline instructions for securing the condenser at the necessary slant.

- See last page for Extended Warranty information.

STEP 1**PREPARATION OF COOLING UNIT BEFORE INSTALLATION**

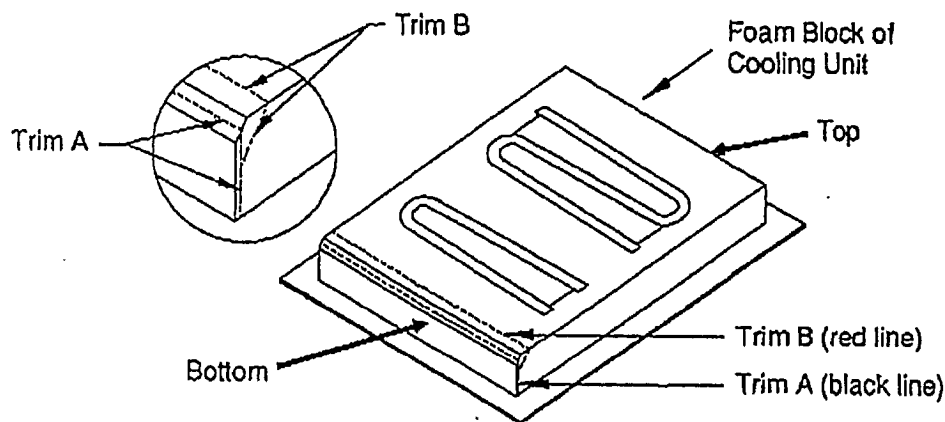
This cooling unit will accommodate several refrigerator models. The foam block of the cooling unit may require trimming. Read information below carefully before proceeding with the trimming instructions. If no trimming is required, proceed to STEP 2.

How To Identify Refrigerator Model Which May Require The Foam Block To Be Trimmed.

Model	
778 EG2, EG3.....	Trim A only.
838 EG2, EG3.....	Trim A only.
8662, 8663	No trim required
8682, 8683	No trim required
876 EG2 Serial numbers 24,769 and up	No trim required
876 EG2 Serial numbers before 24,769.....	Trim A only
876 EG3 Serial numbers 2458 and up.....	No trim required
876 EG3 Serial numbers before 2458.....	Trim A only
878 EG2 Serial numbers 4171 and up.....	No trim required
878 EG2 Serial numbers before 4171.....	Trim A and B
878 EG3 Serial numbers 1317 and up.....	No trim required
878 EG3 Serial numbers before 1317.....	Trim A and B
8010 EG2, EG3.....	Trim A and B
8310 EG2, EG3.....	Trim A and B

How To Trim Foam Block**CAUTION**

Trim the foam block according to instructions. Do not remove foam insulation beyond the marked lines. Doing so can cause misalignment of cooling unit during installation, cause excessive moisture in the interior of refrigerator cabinet, or result in insufficient cooling.



Trim cut A: Use a carpenter's saw (or similar tool) to cut along black line. This cut will remove 1/4" of insulation.

Trim cut B: Cut along red line after trim cut "A" is made. This cut will remove a 45 degree section.

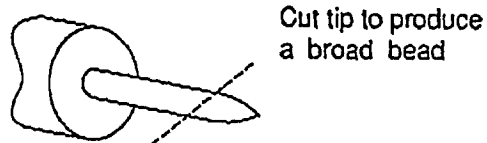
STEP 2

PREPARATION OF COOLING UNIT BEFORE INSTALLATION

In the carton with the cooling unit will be two (2) tubes of materials. One (1) tube contains transfer mastic and one (1) tube contains permagum.

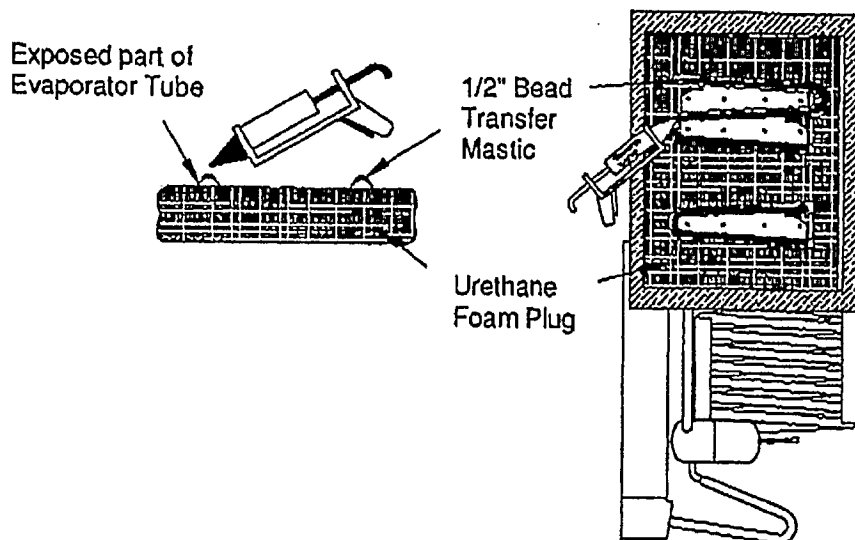
How To Apply Transfer Mastic

The transfer mastic is applied to the exposed portion of the high and low evaporator tubes as illustrated below.



⚠ CAUTION

The transfer mastic must be applied with a 1/2" bead and directly to the entire length of the exposed tubes. Failure to do so will reduce the transfer efficiency and result in poor refrigerator performance.



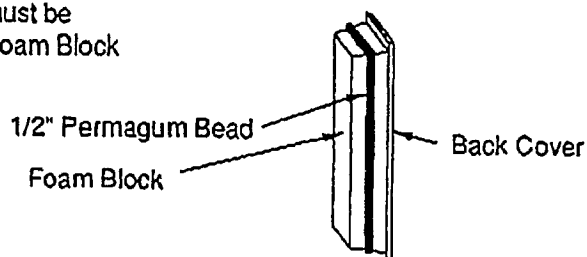
How To Apply Permagum

The permagum must be applied to the sides, top, and bottom of the cooling unit foam block. (Refer to illustrations below.)

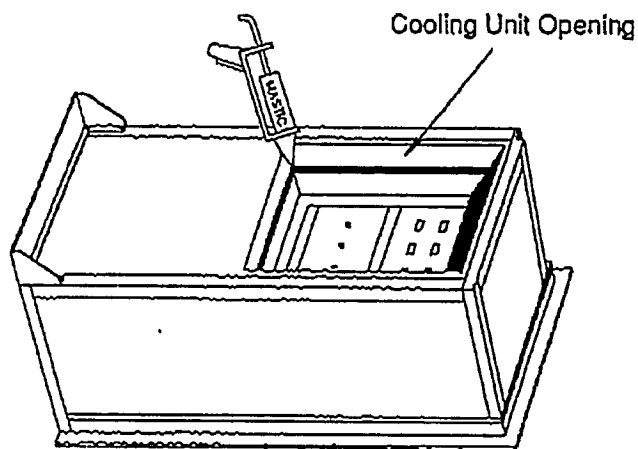
⚠ CAUTION

Failure to apply the permagum will result in excessive moisture in the interior of the refrigerator, as well as poor refrigerator performance.

Permagum Bead must be placed on all four Foam Block sides as shown.



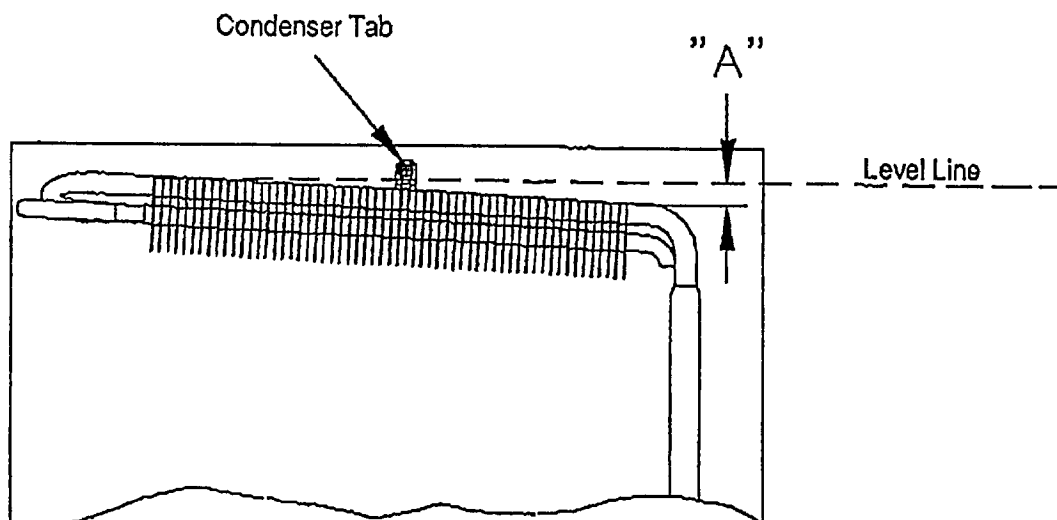
NOTE: Apply all remaining permagum around cooling unit opening of refrigerator cabinet for further insurance of a good seal.



STEP 3

CONDENSER SLANT

When installing the cooling unit, do not install the screw holding the condenser tab until the condenser slant is checked. With the refrigerator in a level position, draw a level line starting at the top left corner of the condenser, as shown. The left side of the condenser can be raised or lowered slightly to obtain the "A" dimension. Install screw to tab to maintain "A" dimension.



Models	"A" Dimension
Single Door Models	5/8" Min. 1" Max.
Double Door Models	3/4" Min. 1 1/4" Max.

COOLING UNIT EXTENDED WARRANTY INFORMATION

NORCOLD E.S.P.

EXTENDED COOLING UNIT SERVICE PROTECTION PLAN

An additional four year Service Contract is now available to original purchasers of Norcold refrigerators. For only \$40.00 you get:

- * Four extra years protection against cooling unit failure.
- * Automatic replacement of defective cooling unit.
- * Pre-paid freight from your dealer to Norcold and return.
- * Labor free of charge.

The E.S.P. (Extended Service Protection) plan can be obtained by mailing your check for \$40.00*, U.S. funds to:

**NORCOLD
P O BOX 4248
SIDNEY OH 45365-4248**

If mailing in Canada:
GREG LUND PRODUCTS LTD
P O BOX 760
OAKVILLE ONTARIO CANADA L6J 5C4

E.S.P. is a service contract between Norcold and the original purchaser. The contract provides replacement of a defective cooling unit only for this refrigerator (freight, parts and labor) for an additional period of four years after expiration of the original Limited Warranty. The refrigerator must be delivered to Norcold Service Center together with the Norcold E.S.P. card showing E.S.P. coverage. An E.S.P. card will be mailed to the original purchaser upon receipt of a completed Service Contract Application form and a check covering the E.S.P. charge. E.S.P. coverage is non-transferable and non-refundable.

To register your refrigerator, fill out the warranty Service Contract Application - i.e.; Tear Sheet Form in yellow envelope or include the following information (Please Print Clearly):

1. Owner's name and address.
2. Refrigerator model number.
3. Refrigerator serial number.
4. Date of purchase.
5. Check for \$40.00* (payable to Norcold).

Applications will be accepted only if they are mailed within ninety (90) days after date of purchase.

*Ohio residents, add \$2.60 sales tax.

PACKING SLIP

Nº 50549

NORCOLD, INC.

1 CENTURY DRIVE • GETTYSBURG, OHIO 45328
PHONE: (937) 497-3073 • FAX: (937) 497-3074

DATE

S
O
L
D
T
O

NORCOLD (PLANT 7)

600 KUTHER ROAD

SIDNEY, OH 45365

S
H
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P
T
O

SAME

U/M	PCS.	QTY. SHP.	DESCRIPTION	P/N
			S/N - R800401	NA4
			S/N - R800601	NA6
			S/N - R800801	NA8
			S/N - R801001	NA10
			S/N - R800200 (3-WAY)	NA2
			S/N - R800202 (WINNEBAGO)	ACU202
			S/N - R800201 (2-WAY)	NA2-2
			S/N - R801201	ACU1201
			S/N - 8W1901	ACU503
			S/N - 8W1502	ACU203
			S/N - 8W1801	ACU403
			S/N - 8W1402	ACU302
			S/N - 8W1401	ACU302-2

PACKED BY

TRUCK DRIVER

NORCOLD RECEIVING

ARC-602 REV.2/01

VPP INDUSTRIES (937) 526-3213 1M 2/01



FORM #ARC-400

STRAIGHT BILL OF LADING—SHORT FORM—Original—Not Negotiable.

Carrier NORCOLD

Shipper's No.

Carrier's No.

RECEIVED, subject to the classifications and lawfully filed tariffs in effect on the date of the issue of this Bill of Lading.

at 20 from

the property described below in apparent good order, except as noted (contents and condition of contents of packages unknown) marked consigned and destined as indicated below which said carrier (the word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under this contract) agrees to carry to its usual place of delivery at said destination, if on its route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed as to each carrier of all or any of said property over all or any portion of said route to destination and as to each party at any time interested in all or any of said property, that every service to be performed hereunder shall be subject to all the terms and conditions of the Uniform Domestic Straight Bill of Lading set forth in Uniform Freight Classification in effect on the date hereof, if this is a rail or a rail water shipment, or (2) in the applicable motor carrier classification of tariff if this is a motor carrier shipment. Shipper hereby certifies that he is familiar with all the terms and conditions of the said bill of lading, including those on the back hereof, set forth in the classification or tariff which governs the transportation of this shipment, and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

Consigned to NORCOLD

Destination 600 KUTHER ROAD, SIDNEY

State OH

(Map or street address of consignee—For purposes of notification only.)

Zip Code 45365

County SHELBY

Delivery Address *

(* To be filled out only when shipper desires and governing tariffs provide for delivery thereat.)

Route NORCOLD

Delivery Carrier NORCOLD

Car or vehicle Initials

No.

No. Packages	H.M.	Kind of Package, Description of Articles, Special Marks, and Exceptions	Weight (Sub. to Car.)	Class of Rate	Check Column	Remarks
		CRATES				
	X	Refrigerating Machine, Ltd. Qty.				
		2.1, NA 1954, Cooling Units				
		N.O.I. Item 53120, Containing .77# Ammonia Solution Unit				
		R800200/1 - NA2 - Box of 16				
		R800401 - NA4 - Box of 10				
		R800601 - NA6 - Box of 9				
		R800801 - NA8 - Box of 6				
		R801001 - NA10 - Box of 6				
		8W1502 - ACU203 - Box of 14				
		8W1401/2 - ACU302 - Box of 12				
		R801201 - ACU1201 - Box of 7				
		8W1901 - ACU503 - Box of 7				
		8W1801 - ACU403 - Box of 9				

"If this shipment moves between two ports by a carrier by water, the law requires that the bill of lading shall state whether it is 'carriers or shipper's weight.'
NOTE—Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property.
The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding

per

† "The fibre boxes used for this shipment conform to the specifications set forth in the box maker's certificate thereon, and all other requirements of Uniform Freight Classification."
‡ Shipper's imprint in lieu of stamp: not a part of bill of lading approved by the Interstate Commerce Commission.

SHIPPED IN
ACCORDANCE
WITH
NAERG96 115

Driver's Address

NORCOLD, INC.

Shipper, Per

Agent, Per

Permanent post-office address of shipper. 1 CENTURY DRIVE, GETTYSBURG, OH 45328

1



Norcold Inc.
One Century Drive
P. O. Box 295
Gettysburg OH 45328
Phone - (937) 447-2241
(937) 497-3073
Fax - (937) 497-3074

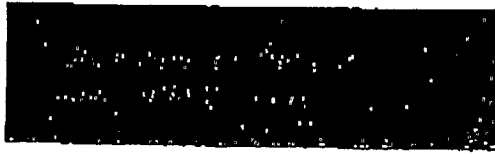
To: Ms. Deborah Booth Fax: (202)-366-3012
From: CAROL BONNER Date: 4/3/2001
Re: Picture of Final product Pages: 6 (including cover)

☐ Urgent ☒ For Review ☐ Please Comment ☐ Please Reply ☐ Please Recycle

Attached are the pictures of the crates.
Also Attached is ~~the~~ picture of final product.
Please call if there are additional covers

NORCOLD

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NORCOLD INC.

For over forty years, Norcold has provided alternate energy refrigeration to our customers. Our customers are the innovators in the recreational vehicle, marine and trucking industries.

We have over 400 employees, with ISO 9001 Certified manufacturing facilities in Gettysburg, Ohio and Sidney, Ohio.

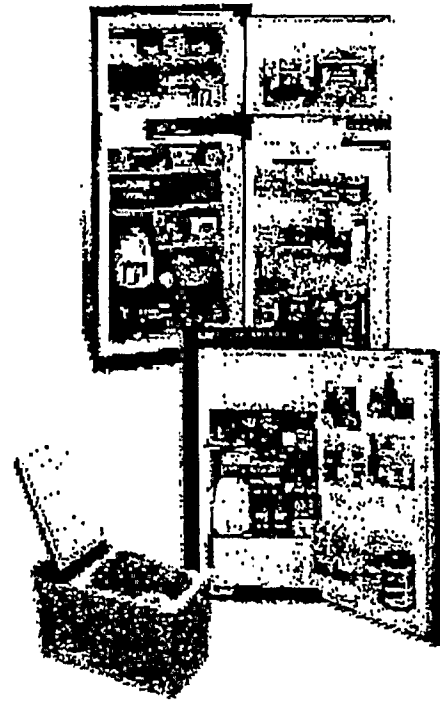
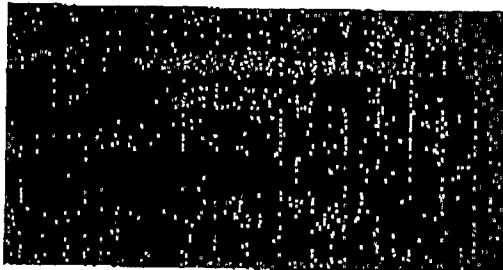
OUR PRODUCTS

Norcold offers a complete lineup of the finest recreational refrigerators available.

Quality and performance are evident in every step of the manufacturing process.

Norcold refrigerators are:

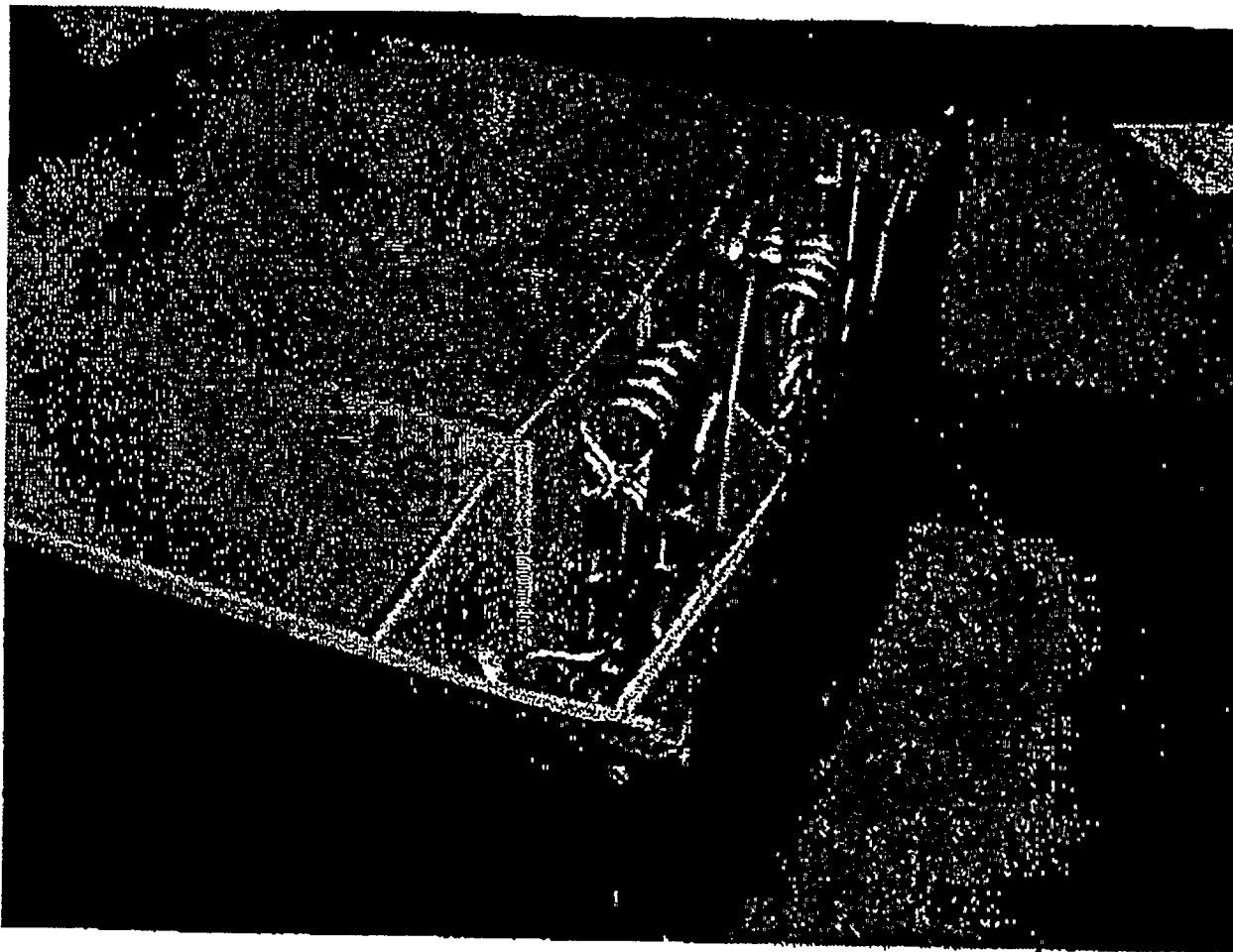
- * Designed with input from our users.
- * Built to take the rigors of travel.
- * Solidly backed by Norcold.

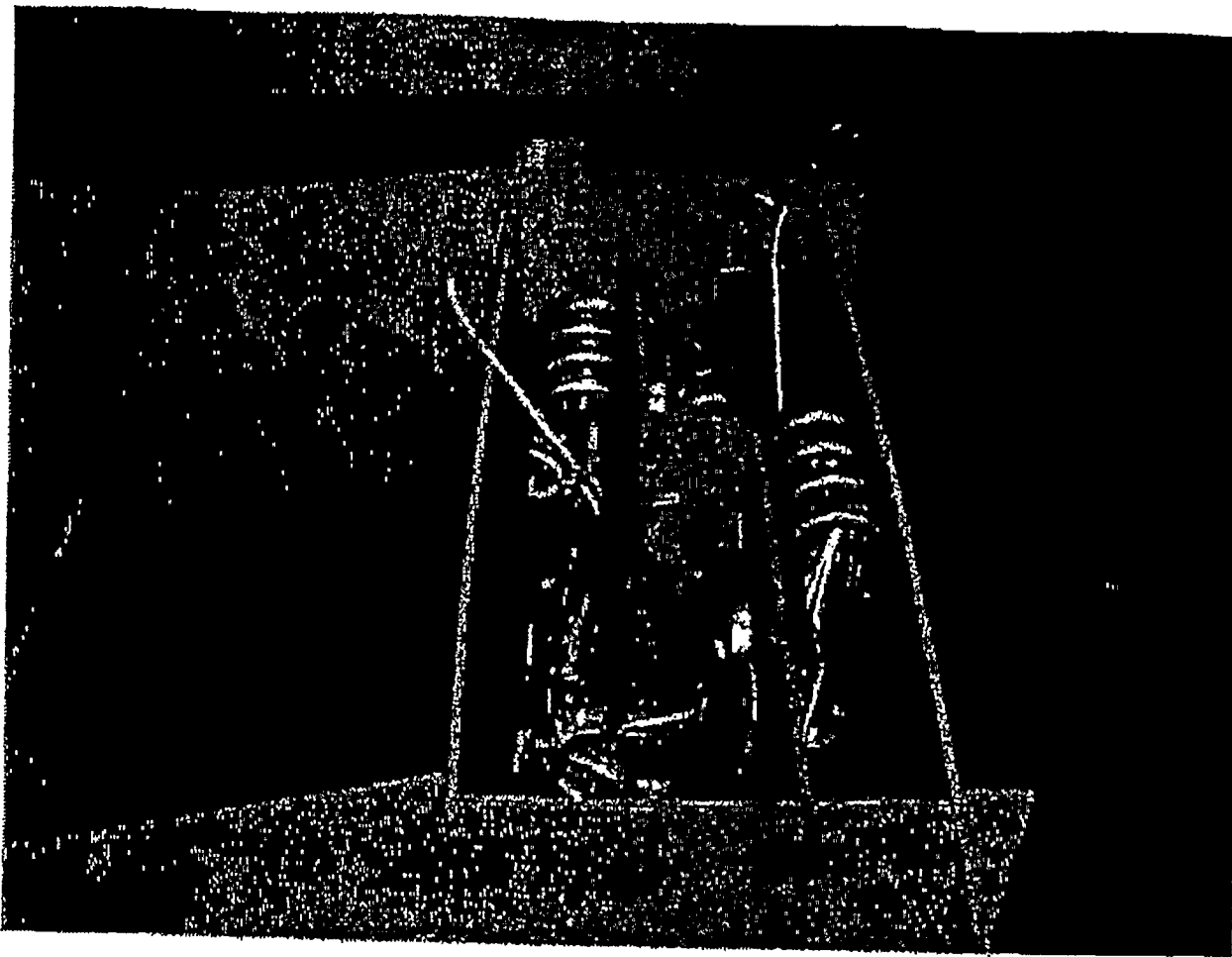


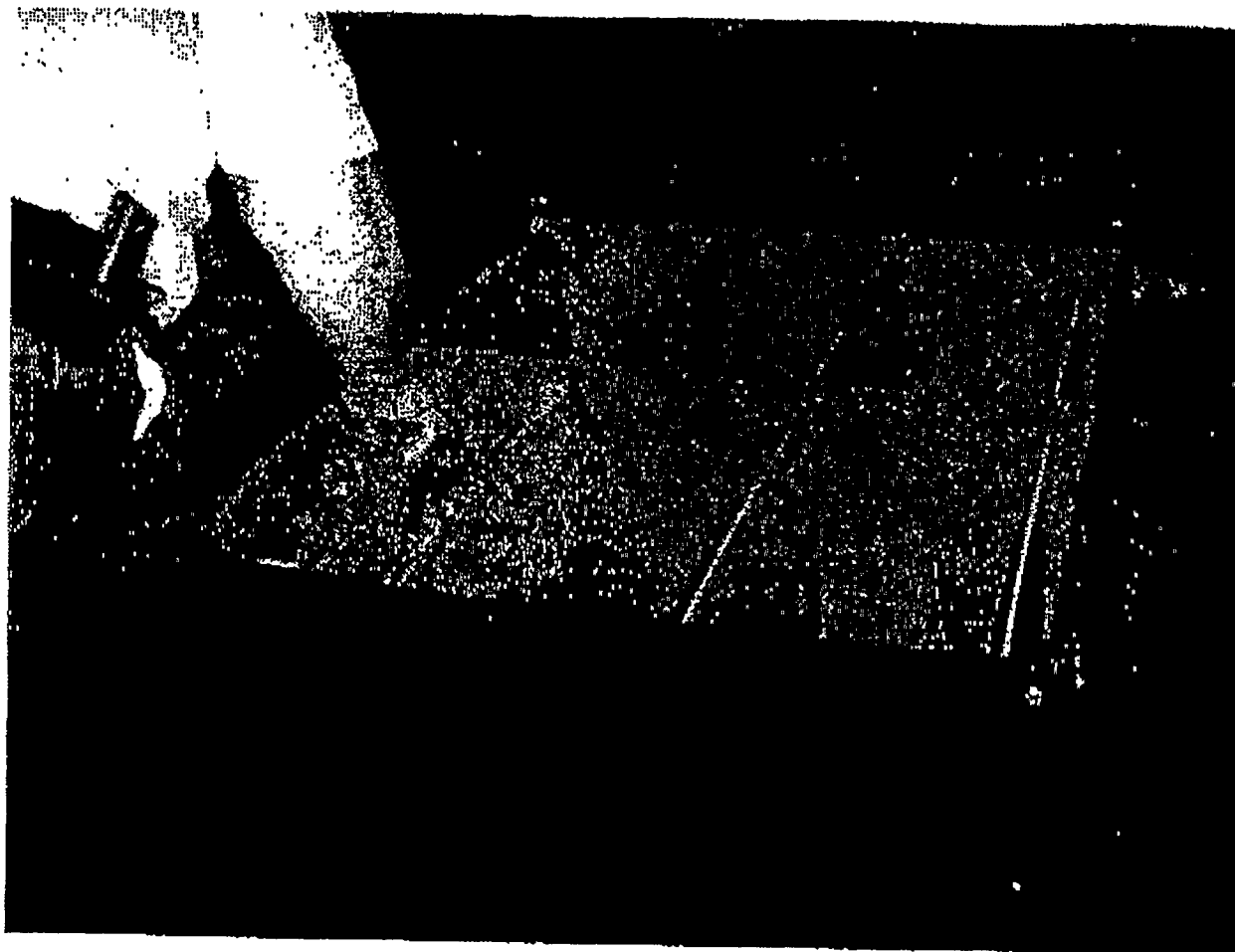
An Equal Opportunity Employer

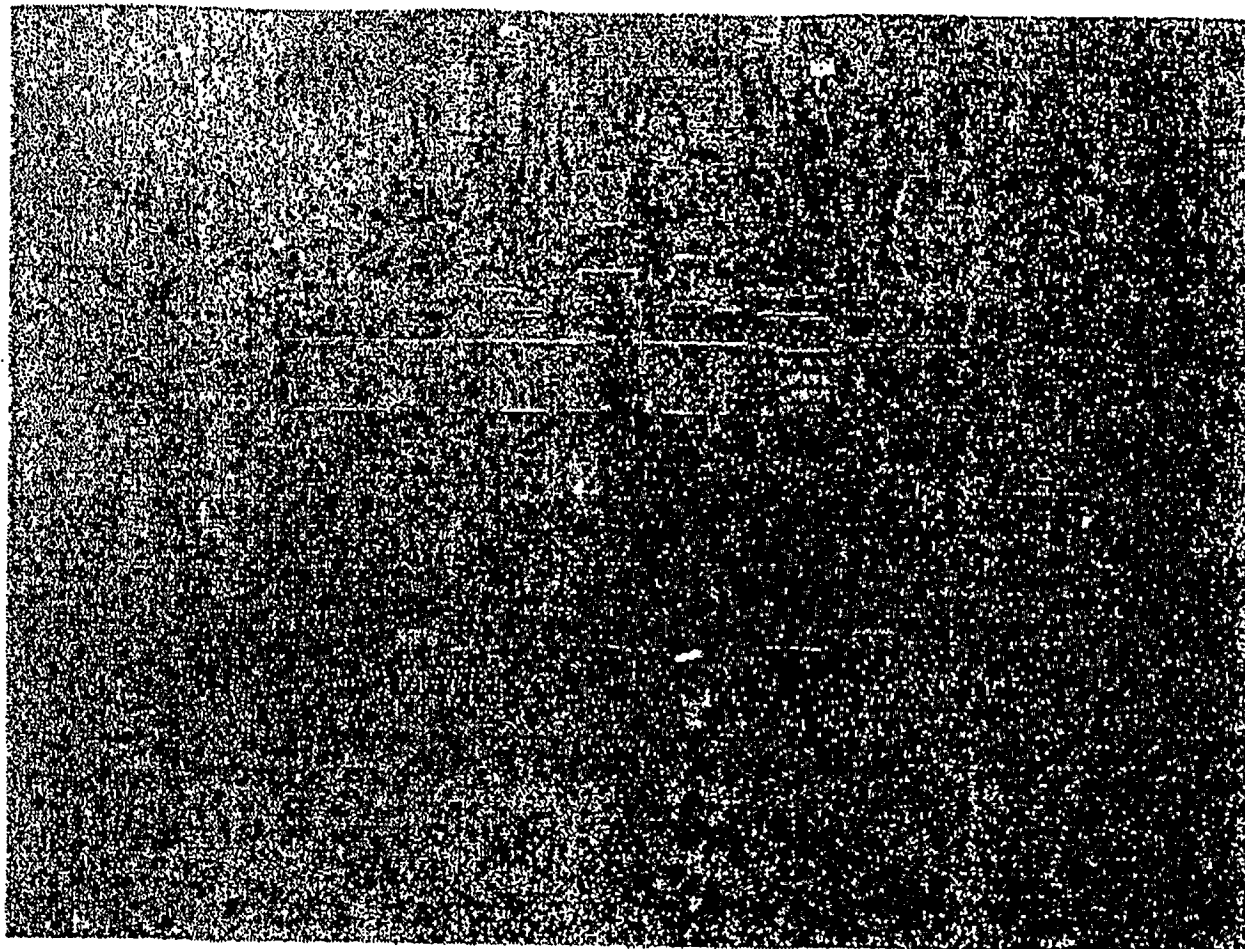


Norcold Inc.
600 South Kuther Rd
Sidney, OH 45365
Phone (937) 497-3080
Fax (937) 497-3085
www.norcold.com











Norcold Inc.
One Century Drive
P. O. Box 295
Gettysburg OH 45328
Phone - (937) 447-2241
(937) 497-3073
Fax - (937) 497-3074

To: Deborah Booth Fax: 202-366-3012
From: Carol Bonner Date: _____
Re: DOT question Pages: _____
Additional information.

☐ Urgent☒ For Review☐ Please Comment☐ Please Reply☐ Please Recycle

Attached is a copy of our Packaging
Certifications.

NORCOLD

.....



To: Jim Liggett

From: Chery Branscum
Packaging Engineer

Subject: UN Testing Reports

Date: January 6, 1995

Here is a copy of the UN testing results performed by g/h Testing Lab in Cincinnati. These testing reports are required for persons shipping hazardous materials. These reports must be kept on file according to DOT regulation CFR 49 § 178.602 starting with paragraph (k). I have attached a copy for your information.

If you have any questions please give myself (6954) or Steve Fogle (6728) a call.

Thanks,


Chery

c: Steve Fogle
Fritz Serr

§ 178.602

49 CFR Ch. I (10-1-93 Edition)

lective testing of packagings that differ only in minor respects from a tested type.

(h) *Approval of equivalent packagings.* A packaging having specifications different from those in §§ 178.504-178.523 of this part, or which is tested using methods or test intervals, other than those specified in subpart M of this part, may be used if approved by the Associate Administrator for Hazardous Materials Safety. Such packagings must be shown to be equally effective, and testing methods used must be equivalent.

(i) *Proof of compliance.* Notwithstanding the periodic retest intervals specified in paragraph (e) of this section, the Associate Administrator for Hazardous Materials Safety may at any time require demonstration of compliance by a manufacturer, through testing in accordance with this subpart, that packagings meet the requirements of this subpart. As required by the Associate Administrator for Hazardous Materials Safety, the manufacturer shall either—

(1) Conduct performance tests, or have tests conducted by an independent testing facility, in accordance with this subpart; or

(2) Supply packagings, in quantities sufficient to conduct tests in accordance with this subpart, to the Associate Administrator for Hazardous Materials Safety or a designated representative of the Associate Administrator.

(j) *Coatings.* If an inner treatment or coating of a packaging is required for safety reasons, the manufacturer shall design the packaging so that the treatment or coating retains its protective properties even after withstanding the tests prescribed by this subpart.

(k) *Record retention.* The person who certifies the tested design type shall—

(1) Keep records of design qualification tests, including specific types, dates, locations, packaging specifications, test specifics (drop heights, hydrostatic pressures, etc.), results, and test operators' names or name of person responsible for testing, for each packaging, at each location where that packaging is manufactured and at each location where design qualification tests are conducted, as long as the

packaging is produced and for at least two years thereafter.

(2) Keep records of periodic retests, including specific types, dates, locations, packaging specifications, test specifics (drop heights, hydrostatic pressures, etc.), results, and test operators' names or name of person responsible for testing, at each location where that packaging is manufactured and at each location where periodic tests are conducted, until such tests are successfully performed again and for at least two years from the date of each test; and

(3) Make all records of design qualification tests and periodic retests available for inspection by a representative of the Department upon request.

[Amdt. 178-97, 56 FR 52723, Dec. 21, 1990, as amended at 56 FR 66285, Dec. 20, 1991; 57 FR 45465, Oct. 1, 1992]

§ 178.602 Preparation of packagings and packages for testing.

(a) Except as otherwise provided in this subchapter, each packaging and package must be closed in preparation for testing and tests must be carried out in the same manner as if prepared for transportation, including inner packagings in the case of combination packagings.

(b) For the drop and stacking test, inner and single-unit receptacles must be filled to not less than 95 percent of maximum capacity (see § 171.8 of this subchapter) in the case of solids and not less than 98 percent of maximum capacity in the case of liquids. The material to be transported in the packagings may be replaced by a non-hazardous material, except for chemical compatibility testing or where this would invalidate the results of the tests.

(c) If the material to be transported is replaced for test purposes by a non-hazardous material, the material used must be of the same or higher specific gravity as the material to be carried, and its other physical properties (grain, size, viscosity) which might influence the results of the required tests must correspond as closely as possible to those of the hazardous material to be transported. Water may also be used for the liquid drop test under the conditions specified in § 178.603(d)(2) of this



Package &
Product
Testing and
Consulting, Inc.

11440 Rockfield Court
Cincinnati, OH 45241
(513) 772-6669
Fax: (513) 772-6709

TO: Mrs. Chery Branscum
Packaging Engineer
Norcold, An Alcoa Company
600 S. Kuther Road
Sidney, Ohio 45365

DATE: October 31, 1994

FROM: Mr. Bernhard Bieri, III
Laboratory Manager
gh Package/Product Testing & Consulting, Inc.

SUBJECT: United Nations Hazardous Materials Testing and
Certification for Packaged Norcold Refrigeration Systems
UN2672 Corrosive - 4G Combination Pack Group III.

Dear Mrs. Branscum,

The attached provides a UN Certification and test report of
conducted UN Testing with results on subject UN2672 4G Combination
Packs.

These packs were subjected to vibration, free fall drops, cobb
moisture and stacking (compression) testing per UN Test
Specifications. Details of specific procedures and test
conditions/results are provided in the attached report.

Please review the attached report and, should you have questions
regarding its contents or testing, please contact me here at gh
Testing and Consulting, Inc. An invoice for services rendered is
attached to this report.

It was a pleasure working with you and I look forward to working
with you in the near future.

Yours Truly,

Mr. Bernhard Bieri, III
Laboratory Manager
gh Package/Product Testing & Consulting, Inc.

Attachments

BB/rg



Package &
Product
Testing and
Consulting, Inc.

11440 Rockfield Court
Cincinnati, OH 45241
(513) 772-6669
Fax: (513) 772-6709

UNITED NATIONS PACKAGING CERTIFICATION (Per CFR 49)

DATE: October 31, 1994

CERTIFICATION NO. USA/+AP0758

U.N. CERTIFICATION REQUESTOR: Norcold, A Alcoa Co.
600 S. Kuther Road
P.O. Box 180
Sidney, Ohio 45365

ATTEN: Mrs. Chery Branscum

PACKAGING CERTIFICATION IDENTIFICATION AGENCY SA-890601

gh Package/Product Testing & Consulting, Inc.
11440 Rockfield Court
Cincinnati, Ohio 45241
(513) 772-6669

XXXXXX PASSENGER AIR

 CARGO AIR

 SURFACE SHIPMENT ONLY

TEST PURPOSE

The purpose of this testing conducted on subject UN2672 Hazardous Materials packaging was to qualify/certify this packaging based on United Nations Test Requirements for Packaging Group III Criteria. The package products are listed as UN2672 (Corrosive) in an 4G Combination Package (4 Pack Types - Gaylord Containers).

TEST PROCEDURES

The Test Procedures/Standards utilized for the testing of this pack is described below: Pack was subjected to specified test as established in United States Code of Federal Regulation - Section 49 - Subchapter C - Hazardous Materials Regulations - Parts 100 to 199.

TEST SPECIMEN DESCRIPTION

Models 48, 68, 68IM and 618 (2 way & 3 way) - Gross Weight 149 lbs. (68 Kg):

1. Inner (Primary Pack): NA10 Refrigerant System Part #61687337. Mfg.: Arctek Corp., Gettysburg, Ohio.
2. Outer Pack: (1) Outside Container - Part #61747622: 275 lb. test C Flute, Size: 26" x 26" x 61.12" I.D. - Grade 69-26-69 - Glue HL-7262X - Separable for recycling, basiloid top, gap bottom - Per Drawing C17476. Manufactured by Gaylord Container, Marion, Ohio - supplied by Derby Packaging, Sidney, Ohio.
3. One (1) Bottom Pad, Part #61631822, 350 lb. test Doublewall, B/C Flute - Blank Size: 33.625" x 33.625" - Grade 42-26-42-26-42, Glue HL-7262X - Separable for recycling - Die cut pad - two honeycomb pieces 3 x 17 x 1.125, Per Drawing C16318. Manufactured by Akers Packaging, Middletown, Ohio and Mid States, DeGraff, Ohio - supplied by Derby Packaging, Sidney, Ohio.
4. One (1) Top Pad, Part #61681322: 350 lb. test doublewall B/C Flute - Blank Size: 33.625" x 33.625". Grade 42-26-42-26-42 - Glue HL-7262X - Separable for recycling - Die cut pad - two honeycomb pieces 3 x 22.25 x 1.125, - two honeycomb pieces 3 x 17 x 1.125. Per drawing C16813. Manufactured by Akers Packaging, Middletown, Ohio and Mid States, DeGraff, Ohio - supplied by Derby Packaging, Sidney, Ohio.

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5. Two Spacers Part #617888:
200 lb. singlewall C Flute - Blank Size: 14 x 6.75". Grade 33-26-33 per drawing B17888. Manufactured by Akers Packaging, Middletown, Ohio - supplied by Derby Packaging, Sidney, Ohio.
6. Two (2) Corner Protectors Part #61607322:
200 lb. doublewall B/C Flute - Blank Size: 43.75 x 9.75".
Grade 33-26-26-26-33 - Glue HL-7262X - Separable for recycling
- Two honeycomb pieces 3 x 22.25 x 1.125" per drawing B16073
Manufactured by Akers Packaging, Middletown, Ohio and Mid States, DeGraff, Ohio - supplied by Derby Packaging, Sidney, Ohio.

TESTING ANALYSIS AND RESULTS

Upon completion of testing, each test specimen was reviewed for damage and leakage. Pack met required vibration, cobb, drop tests, and stacking tests. Above UN Pack is considered meeting required UN Testing Criteria for Group III.

CERTIFICATION APPROVED BY:

Mr. Bernhard Bieri, III *Bernhard Bieri*
AGENCY: gh Package/Product Testing
& Consulting, Inc.
11440 Rockfield Court
Cincinnati, Ohio 45241

CERT. NUMBER
UN/4G/Z68/S/94
USA/+APO758



Package &
Product
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11440 Rockfield Court
Cincinnati, OH 45241
(513) 772-6669
Fax: (513) 772-6709

Norcold Incorporated
United Nations Testing of Hazardous Material
Test Report
October 31, 1994

TEST PURPOSE

The purpose of this testing conducted on subject UN2672 Hazardous Materials packaging was to qualify/certify this packaging based on United Nations Test Requirements for Packaging Group III Criteria. The package products are listed as UN2672 (Corrosive) in a 4G Combination Package (4 Pack Types).

DATE(S) TESTS CONDUCTED

October 27, 28, and 31, 1994

PERSONNEL PRESENT DURING TESTING

Mr. Gerald A. Hock CP-P, President & Technical Director, gh Package/Product Testing & Consulting, Inc.
Mr. Bernhard H. Bieri, III., Laboratory Manager, gh Package/Product Testing & Consulting, Inc.

SITE OF TESTING

gh Package/Product Testing & Consulting, Inc.
11440 Rockfield Court
Cincinnati, Ohio 45241

LABORATORY TEMPERATURE AND RELATIVE HUMIDITY

73 Degrees (F) at 50% R.H.

TEST EQUIPMENT

The equipment available to conduct dynamic testing defined in this report is detailed in ATTACHMENT "A-1" at the rear of this document.

TEST PROCEDURES

The following test procedures were those designated by United Nations for testing and were utilized during material and package testing.

UN Combination Pack - 4G - UN2672 "Corrosive" Packing Group III.

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Test Standard: A.S.T.M. D4919-89 entitled "Standard Specification for testing of Hazardous Materials Packaging".

1. Conditioning - Subject packs to standard conditions at 73 degrees (F) at 50% R.H. for a period of 72 hours prior to testing.

2. Water Resistance Test (cobb method) T.A.P.P.I. T441: Subject corrugated container board to thirty (30) minutes exposure to water. Determine if the sample absorption is greater than 155 g/meter².

3. Subject five (5) filled combination packages to five free fall impacts. Packing Group III drop height shall be 0.8 meters (32 inches) above impact area.

Test five (5) packs, one for each drop, conditioned in accordance with #1. Drop individual packs flat on bottom, top, one long side, one short side. Drop box diagonally on the manufacturer's joint bottom corner (5-2-3- corner). Perform drop tests in accordance with Test Method D775.

4. Subject five (5) filled packages (drop test packs) to vibration testing at an input of 1.1 g at 4 Hertz for a period of sixty (60) minutes.

5. Stacking (compression) Testing - Subject three separate filled packs to a stacking load equivalent to a height of three (3) meters for a period of twenty four hours.

6. Basis Weight: T.A.P.P.I. Method T-410 entitled "Grammage of Paper and Paperboard".

7. Caliper: T.A.P.P.I. Method T-411 entitled "Thickness of Paper and Paperboard".

Review all packages and containers prior to and following testing for acceptance.

Norcold
Page 3PACKAGE DESCRIPTIONS

Models 44 (2 way & 3 way*) - Gross Weight 87 lbs. (40 Kg):

1. Inner (Primary Pack): NA4 Refrigerant System Part #61687037.
Mfg.: Arctek Corp., Gettysburg, Ohio
2. Outer Pack: (1) Outside Container - Part #61747322:
Outside Container: 275 lb. test C Flute, Size: 26" x 26" x 32.63 I.D. - Grade 69-26-69 - Glue HL-7262X - Separable for recycling, basiloid top, gap bottom - Per Drawing C17473.
Manufactured by Gaylord Container, Marion, Ohio, supplied by Derby Packaging, Sidney, Ohio
3. One (1) Bottom Pad Part #61631822:
350 lb. test doublewall B/C Flute - Blank Size: 33.625" x 33.625". Grade 42-26-42-26-42 - Glue HL-7262X - Separable for recycling, die cut pad - two honeycomb pieces. Size: 3 x 17 x 1.125" per drawing C16318. Manufactured by Akers Packaging, Middletown, Ohio and Mid States, Degraff, Ohio - supplied by Derby Packaging, Sidney, Ohio.
4. One (1) Top Pad Part # 61681322:
350 lb. test doublewall B/C Flute - Blank Size: 33.625" x 33.625". Grade 42-26-42-26-42 - Glue HL-7262X - Separable for recycling - Die cut pad - two honeycomb pieces 3 x 22.25 x 1.125, two honeycomb pieces 3 x 17 x 1.125" per drawing C16813. Manufactured by Akers Packaging, Middletown, Ohio and Mid States, Degraff, Ohio - supplied by Derby Packaging, Sidney, Ohio.
5. Two Spacers Part # 617888:
200 lb. singlewall C Flute - Blank Size: 14 x 6.75". Grade 33-26-33 per drawing B17888. Manufactured by Akers Packaging, Middletown, Ohio - supplied by Derby Packaging, Sidney, Ohio.
6. Two (2) Corner Protectors Part #61667422:
Corner Protector - 200 lb. doublewall B/C Flute - Blank Size: 17.00 x 9.75". Grade 33-26-26-26-33 - Glue HL-7262X - Separable for recycling - One honeycomb piece 3 x 17 x 1.125" per drawing B16674. Manufactured by Akers Packaging, Middletown, Ohio and Mid States, Degraff, Ohio - supplied by Derby Packaging, Sidney, Ohio

Models 45, 65, 605 (2 way & 3 way) - Gross Weight 107 lbs. (49 kg):

1. Inner (Primary Pack): NA6 Refrigerant System Part #61687137.
Mfg.: Arctek Corp., Gettysburg, Ohio

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2. Outer Pack: One (1) Outside Container Part # 61747422:
275 lb test C Flute - Size: 26 x 26 x 44.25 I.D.
Grade 69-26-69, Glue HL-7262X - Separable for recycling -
basiloid top, gap bottom. Per drawing C17474. Manufactured by
Gaylord Container, Marion, Ohio - supplied by Derby Packaging,
Sidney, Ohio.
3. One (1) Bottom Pad, Part # 61631822:
350 lb. test doublewall B/C Flute - Blank Size: 33.625" x
33.625". Grade 42-26-42-26-42 - Glue HL-7262X separable for
recycling - die cut pad - two honeycomb pieces 3" x 17" x
1.125", Per drawing C16318. Manufactured by Akers Packaging,
Middletown, Ohio and Mid States, DeGraff, Ohio - supplied by
Derby Packaging, Sidney, Ohio.
4. One (1) Top Pad, Part #61681322:
350 lb. test doublewall B/C Flute - Blank Size: 33.625 x
33.625. Grade 42-26-42-26-42 - Glue HL-7262X - Separable for
recycling - Die cut pad - two honeycomb pieces 3 x 22.25 x
1.125" -two honeycomb pieces 3 x 17 x 1.125 - Per drawing
C16813. Manufactured by Akers Packaging, Middletown, Ohio and
Mid States, DeGraff, Ohio - supplied by Derby Packaging,
Sidney, Ohio.
5. Two (2) Spacers, Part #617888:
200 lb. singlewall C Flute - Blank Size: 14 x 6.75 - Grade 33-
26-33 Per Drawing B17888. Manufactured by Akers Packaging,
Middletown, Ohio - supplied by Derby Packaging, Sidney, Ohio.
6. Two (2) Corner Protectors, Part #61624822:
200 lb. doublewall B/C Flute - Blank Size: 33.50 x 9.75" -
Grade 33-26-26-26-33 - Glue HL-7262X separable for recycling -
one honeycomb piece 3 x 22.25 x 1.125 per drawing B16248.
Manufactured by Akers Packaging, Middletown, Ohio and Mid
States, DeGraff, Ohio - supplied by Derby Packaging, Sidney,
Ohio.

Models 46, 66, 66IM, and 616 (2 way & 3 way*) - Gross Weight -
143 lbs. (65 kg):

1. Inner (Primary Pack): NAB Refrigerant System Part #61687237.
Mfg.: Arctek Corp., Gettysburg, Ohio.
2. Outer Pack: (1) Outside Container, Part #61747522:
275 lb. test C Flute - Size: 26 x 26 x 54.12" I.D.
Grade 69-26-69 - Glue HL-7262X separable for recycling -
basiloid top, gap bottom. Per Drawing C17475. Manufactured by
Gaylord Container, Marion, Ohio - supplied by Derby Packaging,
Sidney, Ohio.

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3. One (1) Bottom Pad, Part #61631822:
350 lb. test doublewall B/C Flute - Blank Size: 33.625 x 33.625" - Grade 42-26-42-26-42 - Glue HL-7262X separable for recycling - die cut pad - two honey comb pieces - Size: 3 x 17 x 1.125 - Per drawing C16318. Manufactured by Akers Packaging, Middletown, Ohio and Mid States, DeGraff, Ohio - supplied by Derby Packaging, Sidney, Ohio.
4. One (1) Top Pad, Part # 61681322:
350 lb. test doublewall B/C Flute - Blank Size: 33.625 x 33.625 - Grade 42-26-42-26-42 - Glue HL-7262X separable for recycling - die cut pad - two honeycomb pieces 3 x 22.25 x 1.125 - two honeycomb pieces 3 x 17 x 1.125. Per drawing C16813. Manufactured by Akers Packaging, Middletown, Ohio and Mid States, DeGraff, Ohio - supplied by Derby Packaging, Sidney, Ohio.
5. Two (2) Spacers, Part # 617888:
200 lb. singlewall C Flute - Blank Size: 14 x 6.75 - grade 33-26-33 - Per drawing B17888. Manufactured by Akers Packaging, Middletown, Ohio - supplied by Derby Packaging, Sidney, Ohio.
6. Two (2) Corner Protectors, Part # 61607322:
200 lb. doublewall B/C flute - Blank Size: 43.75 x 9.75 - Grade 33-26-26-26-33 - Glue HL-7262X separable for recycling - two honeycomb pieces 3 x 22.25 x 1.125 - Per drawing B16073. Manufactured by Akers Packaging, Middletown, Ohio and Mid States, DeGraff, Ohio - supplied by Derby Packaging, Sidney, Ohio.

Models 48, 68, 68IM, 618 (2 way & 3 way*) - Gross Wt. 149 lbs.
(68 kg):

1. Inner (Primary) Pack: NA10 Refrigerant System Part #61687337.
Mfg.: Arctek Corp., Gettysburg, Ohio.
2. Outer Pack: One (1) Outside Container Part #61747622:
275 lb. test C Flute - Size: 26 x 26 x 61.12" I.D.
Grade 69-26-69 - Glue HL-7262X separable for recycling - basiloid top, gap bottom - Per drawing C17476. Manufactured by Gaylord Container, Marion, Ohio - Supplied by Derby Packaging, Sidney, Ohio.
3. One (1) Bottom Pad, Part #61631822, 350 lb. test Doublewall, B/C Flute - Blank Size: 33.625" x 33.625" - Grade 42-26-42-26-42, Glue HL-7262X - Separable for recycling - Die cut pad - two honeycomb pieces 3 x 17 x 1.125, Per Drawing C16318. Manufactured by Akers Packaging, Middletown, Ohio and Mid States, DeGraff, Ohio - supplied by Derby Packaging, Sidney, Ohio.

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4. One Top Pad, Part #61681322:
350 lb. test doublewall B/C Flute - Blank Size: 33.625 x 33.625
Grade 42-26-42-26-42 - Glue HL-7262X separable for recycling -
die cut pad - two honey comb pieces 3 x 22.25 x 1.125 -two
honeycomb pieces 3 x 17 x 1.125 - Per drawing C16813.
Manufactured by Akers Packaging, Middletown, Ohio and Mid
States, DeGraff, Ohio - supplied by Derby Packaging, Sidney,
Ohio.
5. Two (2) Spacers, Part # 617888:
200 lb. singlewall C Flute - Blank Size: 14 x 6.75 - Grade 33-
26-33 - Per drawing B17888. Manufactured by Akers Packaging,
Middletown, Ohio - supplied by Derby Packaging, Sidney, Ohio..
6. Two (2) Corner Protectors, Part #61607322:
200 lb. doublewall B/C Flute - Blank Size: 43.75 x 9.75 -
Grade 33-26-26-26-33 - Glue HL-7262X - separable for recycling
- two honeycomb pieces 3 x 22.25 x 1.125 - Per drawing B16073.
Manufactured by Akers Packaging, Middletown, Ohio and Mid
States, DeGraff, Ohio - supplied by Derby Packaging, Sidney,
Ohio.

*NOTE: The only difference between 2 way and 3 way is the 3 way
has DC Electric Capability - Both have gas and electric
systems.

TESTING RESULTS AND ANALYSIS

The results of conducted testing and condition of packages and
contents are provided below (Packing Group III):

a. Water Resistance Test (Cobb Method):
Five (5) corrugated container specimens were subjected to Cobb
(T.A.P.P.I. T441) tests. The water absorption cannot exceed 155
g/meter².

<u>Sample #</u>	<u>Models 442, 6052, 662, and 6182</u> <u>Gain in Moisture</u>	<u>Results</u>
1	125 g/m ²	Passed
2	115 g/m ²	Passed
3	98 g/m ²	Passed
4	111 g/m ²	Passed
5	107 g/m ²	Passed

b. Vibration Test:

Three (3) packages were subjected to one hour of vibration at an
input of 1.1 g at 4 Hertz.

Results: All packs were in good condition with no leakage
following testing.

Norcold
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c. Drop Test:

Three (3) packs were subjected to drop testing from a height of 0.8 meters (32 inches) in the orientation listed below:

<u>Models #442, #6052, #662, and #6182</u>		
<u>Drop #</u>	<u>Orientation</u>	<u>Results</u>
1	Bottom (flat)	Passed
2	Top (flat)	Passed
3	Long Side (flat)	Passed
4	Short Side-End (flat)	Passed
5	Diagonally (M.F.J.) Corner	Passed

d. Stacking (compression) Test: Subject three (3) loaded containers to a comparable load of three meters high (or greater) for a period of twenty four (24) hours.

(Previously tested - Multiple dates - Passed)

e. Carton Material Analysis:

	<u>Basis Weight</u> <u>(lbs./MSF)</u>	<u>Caliper</u> <u>(inches)</u>	<u>Combined Board</u> <u>(Mullen Test)</u>
Inside Liner	71.00	0.0220	445
1st Medium	31.00	0.0090	
Outside Liner	71.00	0.0230	

UN MARKINGS

The assigned UN Markings shall read as follows:

Model 44 (2 way & 3 way)

Models 45, 65, & 605 (2 way & 3 way)

UN/4G/Z40/S/94
USA/+APO755

UN/4G/Z49/S/94
USA/+APO756

ATTACHMENT A-1

Vibration:

A. Sonic Electro-Hydraulic Vibration System including sine wave and Random Capabilities. System includes two Accelerometers, a Vibration Meter, two Endevco Time Base/Amplifier and a Tektronix 500 Series Dual Channel Oscilloscope. Vibration System also includes a Mavotek Model 105 Sine Generator, an H.P. X-Y Plotter and a D.D.S. Storage & Transient Waveform Recorder. System can produce Single or dated Individual Shock Impact Pulses. Hard copy Sine and Random Wave Forms Computer produced.

B. LAB Transportation Simulator - 4000 SHK - Capacity 4000 lbs. Circular Synchronous, Synchronous 30" out of phase, Vortical-Linear, Non Synchronous Motions. Basic Table Size: 5' x 6'.

C. Drop/Shocks:

*Frog Fall Split Leaf Adjustable Drop Tester - 300 lbs. capacity with foot activated Drop Leaf Control. Hard copy Shock Waveforms Computer produced.

*Incline/Impact Ten Foot 300 lbs. Capacity Vectorial Shock Induced with Manual Preset Sled Release. Velocity at Impact is registered using a G.H. 1 Photocell Velocimeter with an Oscilloscope Sync INP Input. Test capability up to 0 MPH. Hard copy Shock Wave Form Computer Generated.

*Transmont Model 65/81 Shock Testing Machine with variable impact programmer, and a 450 lb. impact mounting table. The system will produce a nominal two millisecond $q/2$ sine shock pulse up to 600 g's and rectangular wave pulses with durations to 65 milliseconds $1/2$ sine shock pulse up to 60 g's and rectangular wave pulses with durations to 65 milliseconds and velocity change to 25 ft./sec.

*Overhead "I" Beam Large Capacity Drop Testing 13000 lb. and includes a quick release apparatus with slings for large and heavy Free Fall Impact Testing.

*Cushion Impact Tester (low to high static stress loadings) capable of 40" impact on a cushion specimen size of 0" x 8". Impact head for Foam in Place Dynamic Testing.

*Compression Tester - Three Tonnage Programmable 30,000 lb. capability with four (4) variable load settings. Platen size is 60 inch opening by 72 inches. The apparatus has a fixed/floating crosshead capability with deflection measurement device. System includes an Autographic Chart Recorder.

*Tektronics 25 Megahertz Dual Trace Storage Oscilloscope with an Endevco Model 2775A Shock Amplifier and Accelerometer. This system is used to capture Shock Data on Drop Tester, Incline/Impact Tester and the Vibration Tester.

*Transmont - Test Partner - Three Channel Recording

*I.S.T. Computer Compatible Shock "Box" Capture Unit. Captures Vibration, Shock, Temperature, Humidity and is linked to an IBM Turbo XT Computer. Capable of both Internal or External Capture.

*Three (3) Temperature/Conditioning Chambers Temperature and Relative Humidity projected to produce 35 to 140 Degrees (F) and 30 to 90% Relative Humidity. Additional Chamber can produce -30 to 16" (F).



Markings

Each packaging that is manufactured and tested in accordance with the performance oriented packaging standards of HM-181 must include a marking on the

packaging which indicates that the packaging has been UN tested. The next section describes each portion of the UN marking and what it means.

Example of UN Marking for Solid Hazardous Materials Single or Composite Packagings or Combination Packagings for All Materials



UN Symbol

Gross Mass In Kilograms
4G / X 3 / S / 94 / USA / M0000

Packaging Identification Code

Packing Group Level Equivalent

Solids Or Inner Packagings

Year Of Manufacture

Location Of Manufacture

Certification Mark/ Manufacturer's Symbol

Example of UN Marking for Liquid Hazardous Materials Single or Composite Packaging



1A1 / X 1.5 / 250 / 94 / USA / +AA0000

Specific Gravity

Hydrostatic Test Pressure

United Nations Symbol



4G/X 3 / S / 94/USA / M0000



1A1/X1.5/250/94/USA/+AA0000

The UN in the circle indicates that this packaging has been UN tested and certified.

Packaging Identification Codes



4G/X 3 / S / 94/USA / M0000



1A1/X1.5/250/94/USA/+AA0000

This number/letter combination indicates the type of packaging and material of construction. The chart listed below shows what each letter and number combination would mean.

Packaging Identification Codes	
Numeral (1-7)=Type of Packaging	
1=Drum	2=Wooden Barrel
3=Jerrican	4=Box
5=Bag	6=Composite Packaging
7=Pressure Receptacle	
Capital Letter=Construction Material	
A=Steel	B=Aluminum
C=Natural Wood	D=Plywood
F=Reconstituted Wood	G=Fiberboard
H=Plastic	L=Textile
M=Paper, multi-wall	N=Other Metal
P=Glass, Porcelain, Stoneware	
Number=Sub-Category of Packaging	
For Drums: 1=Nonremovable Head	2=Removable Head
For Bags: 5M1=Multi-wall bags	5M2=Multi-walled, water resistant bag

Any one of the following three styles represents an example of the kind of packaging identification code that may be shown on a UN packaging.

1) There may be a number-letter combination indicating a type of packaging and material of construction. For example:

4G = Fiberboard box

2D = Plywood wooden barrel

2) There may be a number-letter-number combination indicating the type of packaging, material of construction and a subcategory within the type of packaging (See 49CFR part 178.500 for subcategories). For example:

1A1 = Nonremovable head steel drum

5M2 = Multi-walled, water resistant paper bag



Package &
Product
Testing and
Consulting, Inc.

11440 Rockfield Court
Cincinnati, OH 45241
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UNITED NATIONS PACKAGING CERTIFICATION (Per CFR 49)

DATE: October 31, 1994

CERTIFICATION NO. USA/+AP0755

U.N. CERTIFICATION REQUESTOR:

Norcold, A Alcoa Co.

600 S. Kuther Road

P.O. Box 180

Sidney, Ohio 45365

ATTEN: Mrs. Chery Branscum

PACKAGING CERTIFICATION IDENTIFICATION AGENCY

SA-890601

gh Package/Product Testing & Consulting, Inc.

11440 Rockfield Court

Cincinnati, Ohio 45241

(513) 772-6669

XXXXXX PASSENGER AIR

 CARGO AIR

 SURFACE SHIPMENT ONLY

TEST PURPOSE

The purpose of this testing conducted on subject UN2672 Hazardous Materials packaging was to qualify/certify this packaging based on United Nations Test Requirements for Packaging Group III Criteria. The package products are listed as UN2672 (Corrosive) in an 4G Combination Package (4 Pack Types - Gaylord Containers).

TEST PROCEDURES

The Test Procedures/Standards utilized for the testing of this pack is described below: Pack was subjected to specified test as established in United States Code of Federal Regulation - Section 49 - Subchapter C - Hazardous Materials Regulations - Parts 100 to 199.

TEST SPECIMEN DESCRIPTION

Models 44 (2 way & 3 way) - Gross Weight 87 lbs. (40 Kg):

1. Inner (Primary Pack): NA4 Refrigerant System Part #61687037.
Mfg.: Arctek Corp., Gettysburg, Ohio
2. Outer Pack: (1) Outside Container - Part #61747322:
Outside Container: 275 lb. test C Flute, Size: 26" x 26" x 32.63 I.D. - Grade 69-26-69 - Glue HL-7262X - Separable for recycling, basiloid top, gap bottom - Per Drawing C17473.
Manufactured by Gaylord Container, Marion, Ohio - supplied by Derby Packaging, Sidney, Ohio.
3. One (1) Bottom Pad Part #61631822:
350 lb. test doublewall B/C Flute - Blank Size: 33.625" x 33.625". Grade 42-26-42-26-42 - Glue HL-7262X - Separable for recycling - Die cut pad - two honey comb pieces 3 x 17 x 1.125, Per Drawing C16318. Manufactured by Akers Packaging, Middletown, Ohio and Mid States, Degraff, Ohio - supplied by Derby Packaging, Sidney, Ohio.
4. One (1) Top Pad, Part #61681322:
350 lb. test doublewall B/C Flute - Blank Size: 33.625" x 33.625". Grade 42-26-42-26-42 - Glue HL-7262X - Separable for recycling - Die cut pad - two honeycomb pieces 3 x 22.25 x 1.125, two honeycomb pieces 3 x 17 x 1.125" per drawing C16813. Manufactured by Akers Packaging, Middletown, Ohio and Mid States, Degraff, Ohio - supplied by Derby Packaging, Sidney, Ohio.

Page 2 of UN Certification

5. Two Spacers Part #617888:
200 lb. singlewall C Flute - Blank Size: 14 x 6.75". Grade 33-26-33 per drawing B17888. Manufactured by Akers Packaging, Middletown, Ohio - supplied by Derby Packaging, Sidney, Ohio.
6. Two (2) Corner Protectors Part #61667422:
Corner Protector - 200 lb. doublewall B/C Flute - Blank Size: 17.00 x 9.75". Grade 33-26-26-26-33 - Glue HL-7262X - Separable for recycling - One honeycomb piece 3 x 17 x 1.125" per drawing B15574. Manufactured by Akers Packaging, Middletown, Ohio and Mid States, Degraff, Ohio - supplied by Derby Packaging, Sidney, Ohio.

TESTING ANALYSIS AND RESULTS

Upon completion of testing, each test specimen was reviewed for damage and leakage. Pack met required vibration, cobb, drop tests, and stacking tests. Above UN Pack is considered meeting required UN Testing Criteria for Group III.

CERTIFICATION APPROVED BY:

Mr. Bernhard Bieri, III *Bernhard Bieri*
AGENCY: gh Package/Product Testing
& Consulting, Inc.
11440 Rockfield Court
Cincinnati, Ohio 45241

CERT. NUMBER
UN/4G/Z40/S/94
USA/+APO755



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Product
Testing and
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UNITED NATIONS PACKAGING CERTIFICATION (Per CFR 49)

DATE: October 31, 1994

CERTIFICATION NO. USA/4AP0756

U.N. CERTIFICATION REQUESTOR: Norcold, A Alcoa Co.
600 S. Kuther Road
P.O. Box 180
Sidney, Ohio 45365
ATTEN: Mrs. Chery Branscum

PACKAGING CERTIFICATION IDENTIFICATION AGENCY SA-890601
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XXXXXX PASSENGER AIR
CARGO AIR
SURFACE SHIPMENT ONLY

TEST PURPOSE

The purpose of this testing conducted on subject UN2672 Hazardous Materials packaging was to qualify/certify this packaging based on United Nations Test Requirements for Packaging Group III Criteria. The package products are listed as UN2672 (Corrosive) in an 4G Combination Package (4 Pack Types - Gaylord Containers).

TEST PROCEDURES

The Test Procedures/Standards utilized for the testing of this pack is described below: Pack was subjected to specified test as established in United States Code of Federal Regulation - Section 49 - Subchapter C - Hazardous Materials Regulations - Parts 100 to 199.

TEST SPECIMEN DESCRIPTION

Models 45, 65, 605 (2 way & 3 way) - Gross Weight 107 lbs. (49 Kg):

1. Inner (Primary Pack): NA6 Refrigerant System Part #61687137.
Mfg.: Arctek Corp., Gettysburg, Ohio.
2. Outer Pack: (1) Outside Container - Part #61747422:
275 lb. test C Flute, Size: 26" x 26" x 44.25 I.D. -
Grade 69-26-69 - Glue HL-7262X - Separable for recycling,
basiloid top, gap bottom - Per Drawing C17474. Manufactured
by Gaylord Container, Marion, Ohio - supplied by Derby
Packaging, Sidney, Ohio.
3. One (1) Bottom Pad Part #61631822:
350 lb. test doublewall B/C Flute - Blank Size: 33.625" x
33.625". Grade 42-26-42-26-42 - Glue HL-7262X - Separable for
recycling - Die cut pad - two honeycomb pieces 3" x 17" x
1.125", Per drawing C16318. Manufactured by Akers Packaging,
Middletown, Ohio and Mid States, DeGraff, Ohio - supplied by
Derby Packaging, Sidney, Ohio.
4. One (1) Top Pad, Part #61681322:
350 lb. test doublewall B/C Flute - Blank Size: 33.625" x
33.625". Grade 42-26-42-26-42 - Glue HL-7262X - Separable for
recycling - Die cut pad - two honeycomb pieces 3 x 22.25 x
1.125, two honeycomb pieces 3 x 17 x 1.125" per drawing C16813.
Manufactured by Akers Packaging, Middletown, Ohio and Mid
States, DeGraff, Ohio - supplied by Derby Packaging, Sidney,
Ohio.

Page 2 of UN Certification

5. Two Spacers Part #617888:
200 lb. singlewall C Flute - Blank Size: 14 x 6.75". Grade 33-26-33 per drawing B17888. Manufactured by Akers Packaging, Middletown, Ohio - supplied by Derby Packaging, Sidney, Ohio.
6. Two (2) Corner Protectors Part #61624822:
200 lb. doublewall B/C Flute - Blank Size: 33.50" x 9.75".
Grade 33-26-26-26-33 - Glue HL-7262X - Separable for recycling
- One honeycomb piece 3 x 22.25 x 1.125" per drawing B16248.
Manufactured by Akers Packaging, Middletown, Ohio and Mid States, DeGraff, Ohio - supplied by Derby Packaging, Sidney, Ohio.

TESTING ANALYSIS AND RESULTS

Upon completion of testing, each test specimen was reviewed for damage and leakage. Pack met required vibration, cobb, drop tests, and stacking tests. Above UN Pack is considered meeting required UN Testing Criteria for Group III.

CERTIFICATION APPROVED BY:

Mr. Bernhard Bierl, III

AGENCY: gh Package/Product Testing

& Consulting, Inc.

11440 Rockfield Court

Cincinnati, Ohio 45241

CERT. NUMBERUN/4G/Z49/S/94USA/+APO756



Package &
Product
Testing and
Consulting, Inc.

11440 Rockfield Court
Cincinnati, OH 45241
(513) 772-6669
Fax: (513) 772-6709

UNITED NATIONS PACKAGING CERTIFICATION (Per CFR 49)

DATE: October 31, 1994

CERTIFICATION NO. USA/+AP0757

U.N. CERTIFICATION REQUESTOR: Norcold, A Alcoa Co.
600 S. Kuther Road
P.O. Box 180
Sidney, Ohio 45365

ATTEN: Mrs. Chery Branscum

PACKAGING CERTIFICATION IDENTIFICATION AGENCY SA-890601

gh Package/Product Testing & Consulting, Inc.
11440 Rockfield Court
Cincinnati, Ohio 45241
(513) 772-6669

XXXXXX PASSENGER AIR

 CARGO AIR

 SURFACE SHIPMENT ONLY

TEST PURPOSE

The purpose of this testing conducted on subject UN2672 Hazardous Materials packaging was to qualify/certify this packaging based on United Nations Test Requirements for Packaging Group III Criteria. The package products are listed as UN2672 (Corrosive) in an 4G Combination Package (4 Pack Types - Gaylord Containers).

TEST PROCEDURES

The Test Procedures/Standards utilized for the testing of this pack is described below: Pack was subjected to specified test as established in United States Code of Federal Regulation - Section 49 - Subchapter C - Hazardous Materials Regulations - Parts 100 to 199.

TEST SPECIMEN DESCRIPTION

Models 46, 66, 66IM and 616 (2 way & 3 way) - Gross Weight 143 lbs. (65 Kg):

1. Inner (Primary Pack): NA8 Refrigerant System Part #61687237.
Mfg.: Arctek Corp., Gettysburg, Ohio.
2. Outer Pack: (1) Outside Container - Part #61747522:
275 lb. test C Flute, Size: 26" x 26" x 54.12 I.D. -
Grade 69-26-69 - Glue HL-7262X - Separable for recycling,
basiloid top, gap bottom - Per Drawing C17475. Manufactured
by Gaylord Container, Marion, Ohio - supplied by Derby
Packaging, Sidney, Ohio.
3. One (1) Bottom Pad Part #61631822:
350 lb. test doublewall B/C Flute - Blank Size: 33.625" x
33.625" - Grade 42-26-42-26-42 - Glue HL-7262X - Separable
for recycling - Die out pad - two honeycomb pieces - Size:
3 x 17 x 1.125 - Per drawing C16318. Manufactured by Akers
Packaging, Middletown, Ohio and Mid States, DeGraff, Ohio -
supplied by Derby Packaging, Sidney, Ohio.
4. One (1) Top Pad, Part #61681322:
350 lb. test doublewall B/C Flute - Blank Size: 33.625" x
33.625". Grade 42-26-42-26-42 - Glue HL-7262X - Separable for
recycling - Die cut pad - two honeycomb pieces 3 x 22.25 x
1.125, - two honeycomb pieces 3 x 17 x 1.125. Per drawing
C16813. Manufactured by Akers Packaging, Middletown, Ohio and
Mid States, DeGraff, Ohio - supplied by Derby Packaging,
Sidney, Ohio.

Page 2 of UN Certification

5. Two Spacers Part #617888:
200 lb. singlewall C Flute - Blank Size: 14 x 6.75". Grade 33-26-33 per drawing B17888. Manufactured by Akers Packaging, Middletown, Ohio - supplied by Derby Packaging, Sidney, Ohio.
6. Two (2) Corner Protectors Part #61607322:
200 lb. doublewall B/C Flute - Blank Size: 43.75 x 9.75". Grade 33-26-26-26-33 - Glue HL-7262X - Separable for recycling. Two honeycomb pieces 3 x 22.25 x 1.125" per drawing B16073. Manufactured by Akers Packaging, Middletown, Ohio and Mid States, DeGraff, Ohio - supplied by Derby Packaging, Sidney, Ohio.

TESTING ANALYSIS AND RESULTS

Upon completion of testing, each test specimen was reviewed for damage and leakage. Pack met required vibration, cobb, drop tests, and stacking tests. Above UN Pack is considered meeting required UN Testing Criteria for Group III.

CERTIFICATION APPROVED BY:

Mr. Bernhard Bieri, III *Bernhard Bieri III*

AGENCY: gh Package/Product Testing

& Consulting, Inc.

11440 Rockfield Court

Cincinnati, Ohio 45241

CERT. NUMBERUN/4G/Z65/S/94USA/+APO757



U.S. Department
of Transportation

**Research and
Special Programs
Administration**

400 Seventh Street, S.W.
Washington, D.C. 20590

APR 27 2001

Ms. Carol Bonner
Norcold
1 Century Drive
Gettysburg, OH 45328

Ref. No. 01-0075

Dear Ms. Bonner:

This responds to your March 1, 2001 letter requesting clarification on the proper description of your refrigeration cooling units under the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180). Specifically, you ask whether you have properly described the refrigeration cooling units and whether the exception under § 173.307(a)(4)(ii) applies.

According to your letter and follow-up telephone conversations with Deborah Boothe of my staff, Norcold produces absorption refrigeration units for the recreational vehicle industry. Each of the cooling units contain ammonia solution, with the largest unit containing 1,250 milliliters of solution. The gross weight of the largest unit is 67 pounds. The pressure in the cooling unit is between 350-400 psig. Hydrogen is used as a charging agent or dispersant gas to disperse the ammonia solution in the cooling unit. The residual hydrogen, which remains in the cooling unit with the ammonia solution after charging, only amounts to about 12 grams or less for the largest unit manufactured.

Based on the information provided, it is the opinion of this Office that the exception provided in § 173.307(a)(4)(ii) applies to the refrigerating machines and its components (cooling units) manufactured by your company. Therefore, the refrigerating machines and the components (cooling units) are not subject to the HMR.

I hope this answers your inquiry.

Sincerely,



John A. Gale

Transportation Regulations Specialist
Office of Hazardous Materials Standards



Boothe
§ 173.307(a)(4)
Applicability
01-0075

March 1, 2001

Department of Transportation
Research and Special Programs
Office of Hazardous Materials Standards
Washington DC

RE: Norcold Inc./DOT Labeling Requirement

To Whom It May Concern:

Norcold wants clarity and verification that we have taken the right approach in evaluating

1. The proper DOT classification for our refrigerating machines and
2. The lack of need for a "flammable gas" label for packaging and marking.

Norcold is a manufacturing facility that produces absorption refrigeration units for the R.V. industry. As part of the process, the cooling units, which are eventually attached to the refrigerator box, are manufactured in Gettysburg, Ohio. These units are treated as refrigerating machines. The refrigerators are put together at another Norcold facility located in Sidney, Ohio. There are two levels of transportation: 1) from Gettysburg to Sidney (cooling units), and 2) from Sidney to distributors (refrigerators). Each of the cooling units contains ammonia solution, with the largest unit containing 1,250 milliliters of solution.

Hydrogen is used as a charging agent or dispersant gas, to disperse the ammonia solution in the cooling unit. The residual hydrogen, which remains in the cooling unit with the ammonia solution after charging, only amounts to about 12 grams or less for the largest unit manufactured.

In making the determination of the DOT classification, the following was considered:

- The residual hydrogen is NOT pure because it is mixed with the ammonia solution
- The residual hydrogen is dissolved in the ammonia solution and/or mixed with the ammonia vapors; the resulting mixture is both liquid and vapor.
- The resulting liquid/vapor mixture is NOT a flammable gas or flammable liquid, by definition of 8173.115(a) and 8173.120(a)
- The hydrogen is NOT located in a container (tubing) holding hydrogen ONLY; the hydrogen is located in the SAME container (tubing) as the ammonia solution

Thus, for the purpose of DOT classification, the hydrogen is considered part of the ammonia solution or "refrigerant". In addition, Norcold believes that pursuant to 49 CFR 8173.307(a)(4)(ii), our refrigerating machines are excepted and/or exempt from all of the DOT Hazardous Material shipping requirements, including labeling, marking, and placarding, because our refrigerating machines and/or components (cooling units) contain less than 3 gallons of ammonia solution (UN2672). Thus, there is no need for any labels or markings.

Please respond as soon as possible. Thank you for your help in this matter.

Sincerely,

Carol Bonner

Carol Bonner
Environmental Health and Safety Coordinator

cc: file

Regional
23668 Cooper Drive
Elkhart, IN 46515
Phone: 219-266-6660
Fax: 219-266-5779

Headquarters
600 S. Kuther Road
P.O. Box 180
Sidney, OH 45365
Phone: 937-497-3080
General Fax: 937-497-3085
Administrative Fax: 937-497-3167

Gettysburg
1 Century Drive
Gettysburg, OH 45328
Phone: 937-447-2241
Fax: 937-497-3074

please mail or fax response to:

pressure 519 = 350-400
gross wt = 67 lbs. 519
shipped in spec packaging
wooden box
Crutcher



~~Booth~~
~~§173.306(e)~~
~~Applicability~~

April 2, 2001

Ms. Deborah Booth
Department of Transportation
Research and Special Programs
Office of Hazardous Materials Standards
Washington DC

RE: Norcold Inc./DOT Labeling Requirement

Dear Ms. Booth:

This letter is in response to your request for additional information regarding the shipping of refrigeration units manufactured at Norcold.

The units manufactured at Norcold meet the requirements defined in 49 CFR 8173.306(e).

- The largest units do not contain more than 50 pounds of refrigerant (8173.306(e)(i))
- All of the units have only one charge vessel (8173.306(e)(ii))
- All of the units are equipped with a safety device that meet ANSI requirements (8173.306(e)(iii))
- The units have a fuse tube as a safety device, thus there is no applicability for a shut-off valve (8173.306(e)(iv))
- The units are manufactured and inspected/tested in accordance with ANSI Standards (8173.306(e)(v-vi))
- The liquid portion of the refrigerant does not completely fill the pressure vessel and does not exceed the filling density (8173.306(e)(vii ~ viii))

The following addresses the questions and/or additional information requested to complete your evaluation.

1. How are the cooling units shipped to Sidney?

The units are packed in DOT approved steel crates, and/or DOT approved wooden crates (see attached DOT packaging certifications and pictures). However, Norcold is excepted from the packaging requirements via 49 CFR

Regional
23666 Cooper Drive
Elkhart, IN 46515
Phone: 219-268-6660
Fax: 219-268-5779

Headquarters
800 S. Kuther Road
P.O. Box 180
Sidney, OH 45365
Phone: 937-497-3080
General Fax: 937-497-3085
Administrative Fax: 937-497-3167

Gettysburg
1 Century Drive
Gettysburg, OH 45328
Phone: 937-447-2241
Fax: 937-497-3074

Debbie,

4/3/01

Here is the additional
information you requested
from Norcold. It was
was not logged in as
an additional interp.

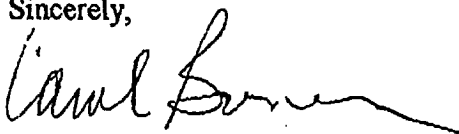
CD

Page 2
DOT

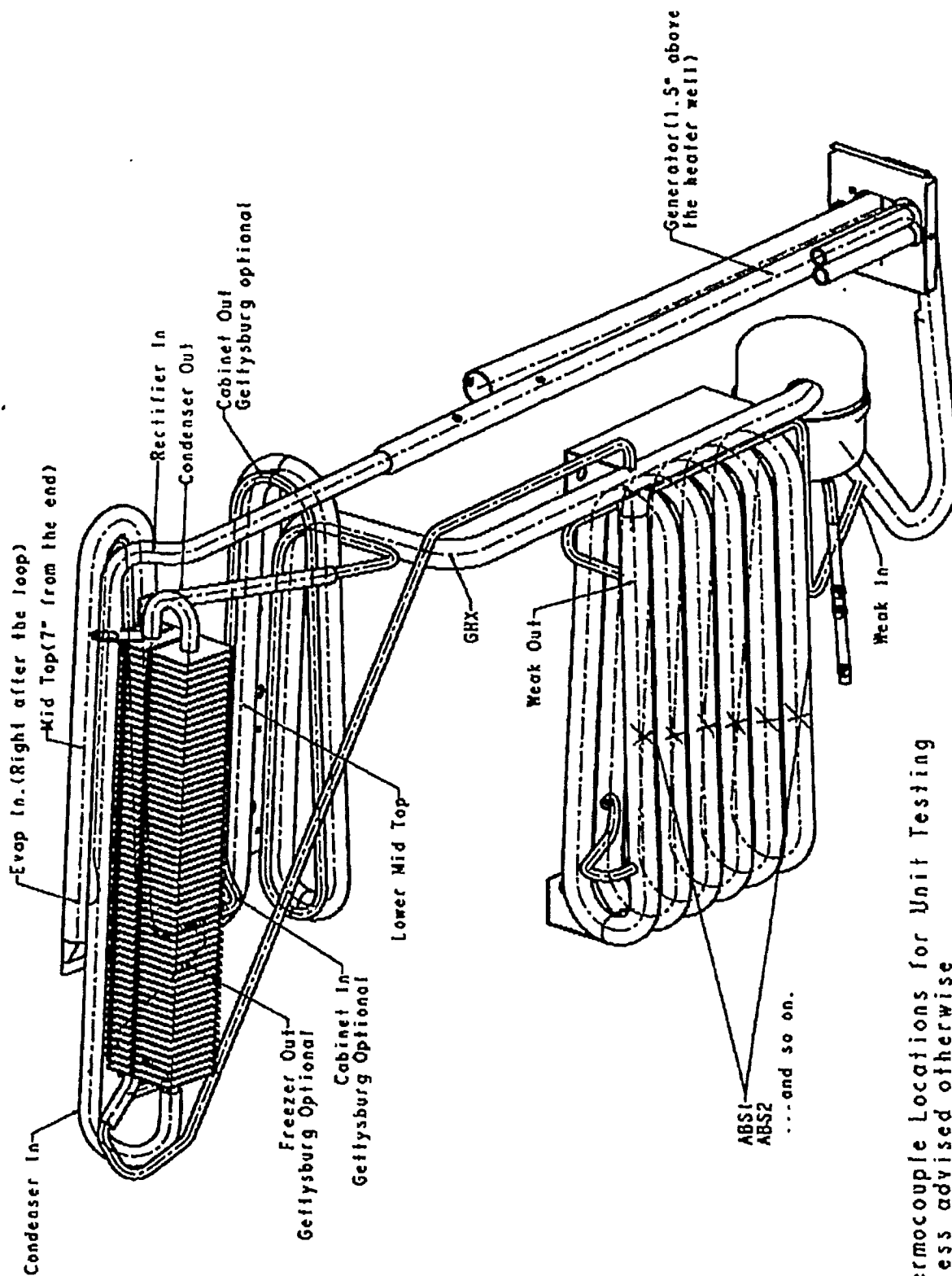
§173.306(e). The crates are currently labeled with a flammable gas label (Norcold believes that it is NOT required. Prior management thought it was better to "over label" when not sure). The units are then loaded onto a DOT licensed and permitted Norcold transport vehicle. Corrosion placards are placed on all four sides when loaded. Shipping papers are completed (see attached) and sent with the load to Sidney.

If there are additional questions, please feel free to call.

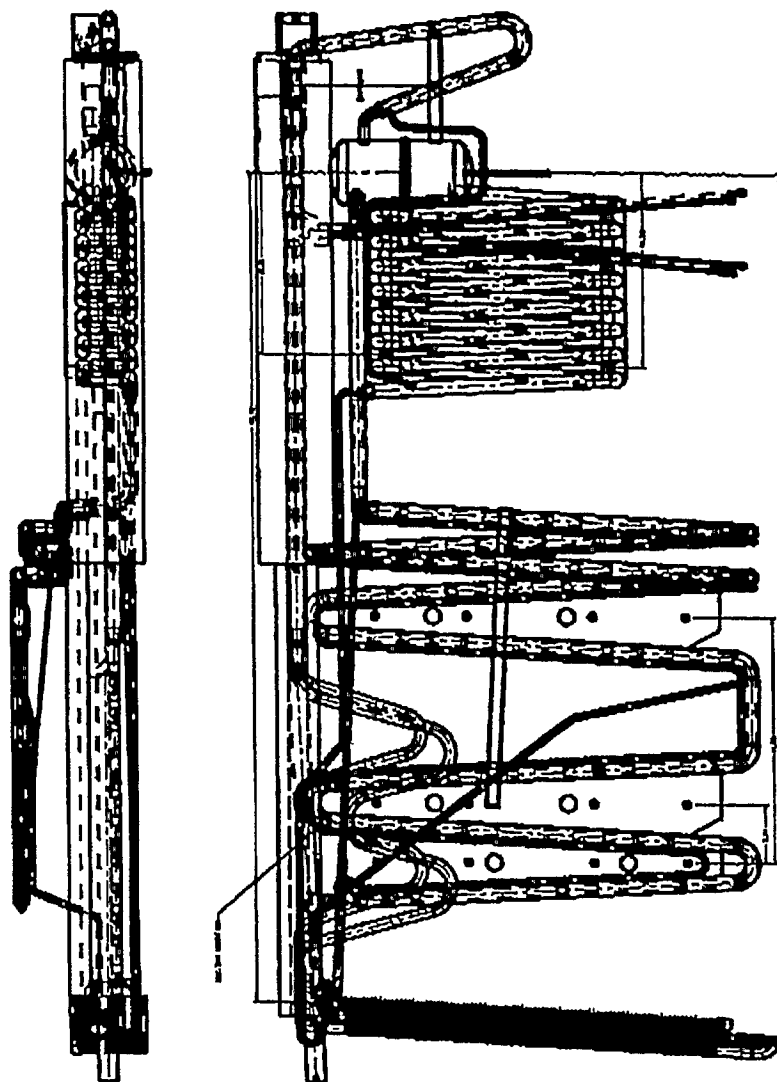
Sincerely,



Carol Bonner
Environmental Health and Safety Coordinator



Thermocouple Locations for Unit Testing
Unless advised otherwise



IMPORTANT INFORMATION

Before replacing the cooling system, read this bulletin. It outlines important procedures which must be followed during the cooling unit replacement.

STEP 1 identifies those models which may require trimming the foam block. If required, trimming instructions are included.

STEP 2 outlines proper (and necessary) application of transfer mastic and permagum sealing.

STEP 3 outline instructions for securing the condenser at the necessary slant.

- See last page for Extended Warranty information.

STEP 1**PREPARATION OF COOLING UNIT BEFORE INSTALLATION**

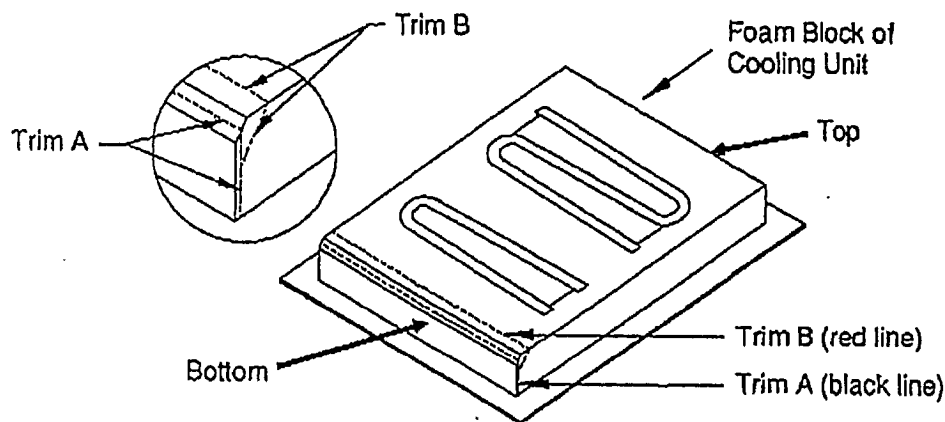
This cooling unit will accommodate several refrigerator models. The foam block of the cooling unit may require trimming. Read information below carefully before proceeding with the trimming instructions. If no trimming is required, proceed to STEP 2.

How To Identify Refrigerator Model Which May Require The Foam Block To Be Trimmed.

Model	
778 EG2, EG3.....	Trim A only.
838 EG2, EG3.....	Trim A only.
8662, 8663	No trim required
8682, 8683	No trim required
876 EG2 Serial numbers 24,769 and up	No trim required
876 EG2 Serial numbers before 24,769.....	Trim A only
876 EG3 Serial numbers 2458 and up.....	No trim required
876 EG3 Serial numbers before 2458.....	Trim A only
878 EG2 Serial numbers 4171 and up.....	No trim required
878 EG2 Serial numbers before 4171.....	Trim A and B
878 EG3 Serial numbers 1317 and up.....	No trim required
878 EG3 Serial numbers before 1317.....	Trim A and B
8010 EG2, EG3.....	Trim A and B
8310 EG2, EG3.....	Trim A and B

How To Trim Foam Block**⚠ CAUTION**

Trim the foam block according to instructions. Do not remove foam insulation beyond the marked lines. Doing so can cause misalignment of cooling unit during installation, cause excessive moisture in the interior of refrigerator cabinet, or result in insufficient cooling.



Trim cut A: Use a carpenter's saw (or similar tool) to cut along black line. This cut will remove 1/4" of insulation.

Trim cut B: Cut along red line after trim cut "A" is made. This cut will remove a 45 degree section.

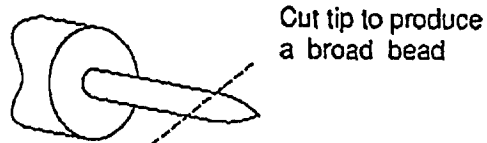
STEP 2

PREPARATION OF COOLING UNIT BEFORE INSTALLATION

In the carton with the cooling unit will be two (2) tubes of materials. One (1) tube contains transfer mastic and one (1) tube contains permagum.

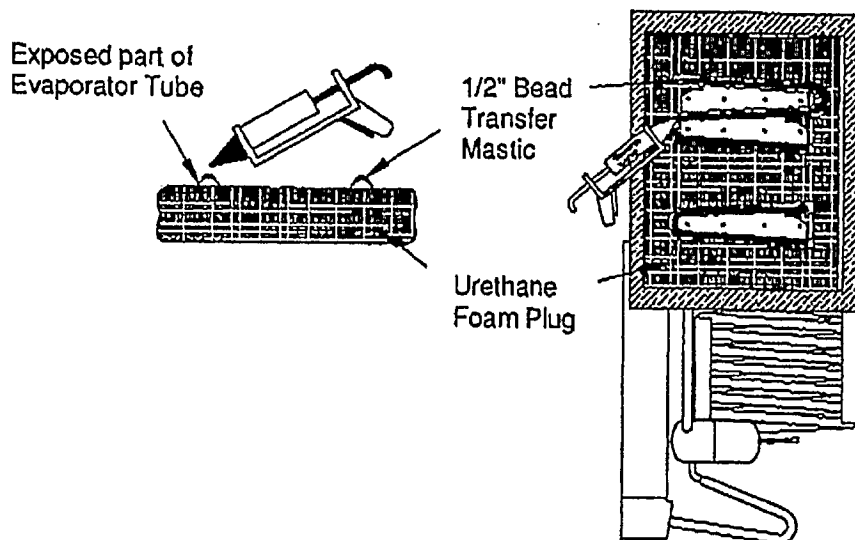
How To Apply Transfer Mastic

The transfer mastic is applied to the exposed portion of the high and low evaporator tubes as illustrated below.



⚠ CAUTION

The transfer mastic must be applied with a 1/2" bead and directly to the entire length of the exposed tubes. Failure to do so will reduce the transfer efficiency and result in poor refrigerator performance.



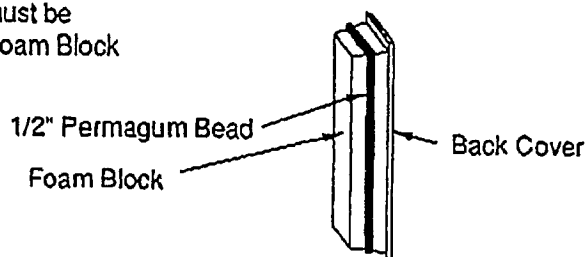
How To Apply Permagem

The permagem must be applied to the sides, top, and bottom of the cooling unit foam block. (Refer to illustrations below.)

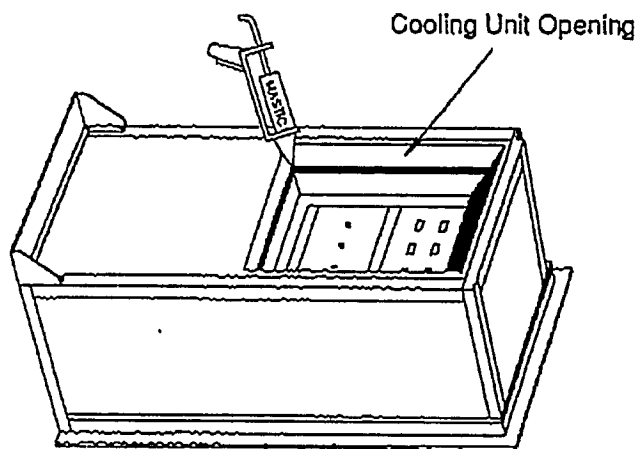
⚠ CAUTION

Failure to apply the permagem will result in excessive moisture in the interior of the refrigerator, as well as poor refrigerator performance.

Permagem Bead must be placed on all four Foam Block sides as shown.



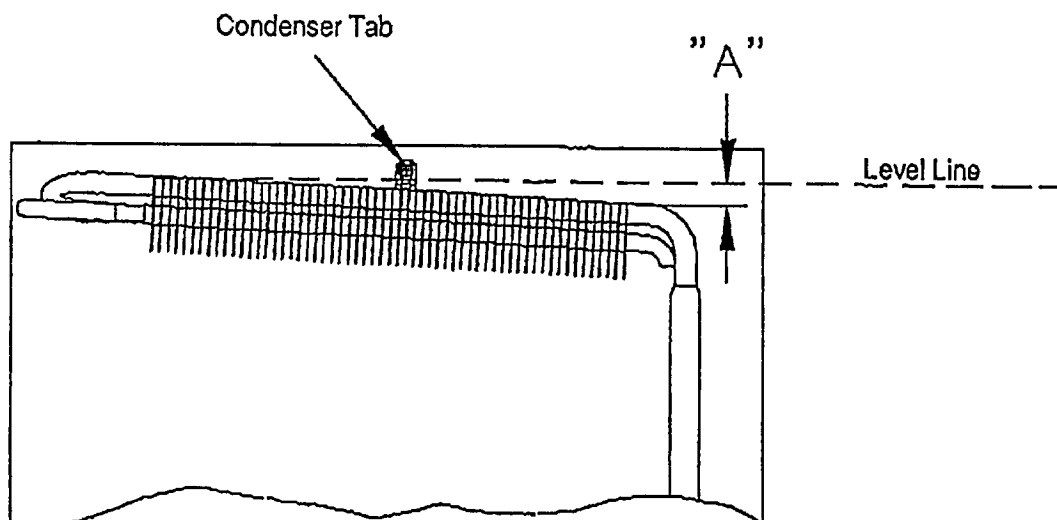
NOTE: Apply all remaining permagum around cooling unit opening of refrigerator cabinet for further insurance of a good seal.



STEP 3

CONDENSER SLANT

When installing the cooling unit, do not install the screw holding the condenser tab until the condenser slant is checked. With the refrigerator in a level position, draw a level line starting at the top left corner of the condenser, as shown. The left side of the condenser can be raised or lowered slightly to obtain the "A" dimension. Install screw to tab to maintain "A" dimension.



Models	"A" Dimension
Single Door Models	5/8" Min. 1" Max.
Double Door Models	3/4" Min. 1 1/4" Max.

COOLING UNIT EXTENDED WARRANTY INFORMATION

NORCOLD E.S.P.

EXTENDED COOLING UNIT SERVICE PROTECTION PLAN

An additional four year Service Contract is now available to original purchasers of Norcold refrigerators. For only \$40.00 you get:

- * Four extra years protection against cooling unit failure.
- * Automatic replacement of defective cooling unit.
- * Pre-paid freight from your dealer to Norcold and return.
- * Labor free of charge.

The E.S.P. (Extended Service Protection) plan can be obtained by mailing your check for \$40.00*, U.S. funds to:

**NORCOLD
P O BOX 4248
SIDNEY OH 45365-4248**

If mailing in Canada:
GREG LUND PRODUCTS LTD
P O BOX 760
OAKVILLE ONTARIO CANADA L6J 5C4

E.S.P. is a service contract between Norcold and the original purchaser. The contract provides replacement of a defective cooling unit only for this refrigerator (freight, parts and labor) for an additional period of four years after expiration of the original Limited Warranty. The refrigerator must be delivered to Norcold Service Center together with the Norcold E.S.P. card showing E.S.P. coverage. An E.S.P. card will be mailed to the original purchaser upon receipt of a completed Service Contract Application form and a check covering the E.S.P. charge. E.S.P. coverage is non-transferable and non-refundable.

To register your refrigerator, fill out the warranty Service Contract Application - i.e.; Tear Sheet Form in yellow envelope or include the following information (Please Print Clearly):

1. Owner's name and address.
2. Refrigerator model number.
3. Refrigerator serial number.
4. Date of purchase.
5. Check for \$40.00* (payable to Norcold).

Applications will be accepted only if they are mailed within ninety (90) days after date of purchase.

*Ohio residents, add \$2.60 sales tax.

PACKING SLIP

Nº 50549

NORCOLD, INC.

1 CENTURY DRIVE • GETTYSBURG, OHIO 45328
PHONE: (937) 497-3073 • FAX: (937) 497-3074

DATE

S
O
L
D
T
O

NORCOLD (PLANT 7)

600 KUTHER ROAD

SIDNEY, OH 45365

S
H
I
P
T
O

SAME

U/M	PCS.	QTY. SHP.	DESCRIPTION	P/N
			S/N - R800401	NA4
			S/N - R800601	NA6
			S/N - R800801	NA8
			S/N - R801001	NA10
			S/N - R800200 (3-WAY)	NA2
			S/N - R800202 (WINNEBAGO)	ACU202
			S/N - R800201 (2-WAY)	NA2-2
			S/N - R801201	ACU1201
			S/N - 8W1901	ACU503
			S/N - 8W1502	ACU203
			S/N - 8W1801	ACU403
			S/N - 8W1402	ACU302
			S/N - 8W1401	ACU302-2

PACKED BY

TRUCK DRIVER

NORCOLD RECEIVING

ARC-602 REV.2/01

VPP INDUSTRIES (937) 526-3213 1M 2/01



FORM #ARC-400

STRAIGHT BILL OF LADING—SHORT FORM—Original—Not Negotiable.

Carrier NORCOLD

Shipper's No.

Carrier's No.

RECEIVED, subject to the classifications and lawfully filed tariffs in effect on the date of the issue of this Bill of Lading.

at 20 from

the property described below in apparent good order, except as noted to contents and condition of contents of packages unknown, marked consigned and destined as indicated below which said carrier (the word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under this contract) agrees to carry to its usual place of delivery at said destination, if on its route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed as to each carrier of all or any of said property over all or any portion of said route to destination and as to each party at any time interested in all or any of said property, that every service to be performed hereunder shall be subject to all the terms and conditions of the Uniform Domestic Straight Bill of Lading set forth in Uniform Freight Classification in effect on the date hereof, if this is a rail or a rail water shipment, or (2) in the applicable motor carrier classification of tariff if this is a motor carrier shipment. Shipper hereby certifies that he is familiar with all the terms and conditions of the said bill of lading, including those on the back hereof, set forth in the classification or tariff which governs the transportation of this shipment, and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

Consigned to NORCOLD

Destination 600 KUTHER ROAD, SIDNEY

State OH

(Map or street address of consignee—For purposes of notification only.)

Zip Code 45365

County SHELBY

Delivery Address *

(* To be filled out only when shipper desires and governing tariffs provide for delivery thereat.)

Route NORCOLD

Delivery Carrier NORCOLD

Car or vehicle Initials

No.

No. Packages	H.M.	Kind of Package, Description of Articles, Special Marks, and Exceptions	Weight (Sub. to Car.)	Class of Rate	Check Column	
		CRATES				
	X	Refrigerating Machine, Ltd. Qty.				
		2.1, NA 1954, Cooling Units				
		N.O.I. Item 53120, Containing .77# Ammonia Solution Unit				
		R800200/1 - NA2 - Box of 16				
		R800401 - NA4 - Box of 10				
		R800601 - NA6 - Box of 9				
		R800801 - NA8 - Box of 6				
		R801001 - NA10 - Box of 6				
		8W1502 - ACU203 - Box of 14				
		8W1401/2 - ACU302 - Box of 12				
		R801201 - ACU1201 - Box of 7				
		8W1901 - ACU503 - Box of 7				
		8W1801 - ACU403 - Box of 9				

"If this shipment moves between two ports by a carrier by water, the law requires that the bill of lading shall state whether it is 'carriers or shipper's weight.'"

NOTE—Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property.

The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding

per

† "The fibre boxes used for this shipment conform to the specifications set forth in the box maker's certificate thereon, and all other requirements of Uniform Freight Classification."

‡ Shipper's imprint in lieu of stamp: not a part of bill of lading approved by the Interstate Commerce Commission.

SHIPPED IN
ACCORDANCE
WITH
NAERG96 115

Driver's Address

NORCOLD, INC.

Shipper, Per

Agent, Per

Permanent post-office address of shipper. 1 CENTURY DRIVE, GETTYSBURG, OH 45328

1



Norcold Inc.
One Century Drive
P. O. Box 295
Gettysburg OH 45328
Phone - (937) 447-2241
(937) 497-3073
Fax - (937) 497-3074

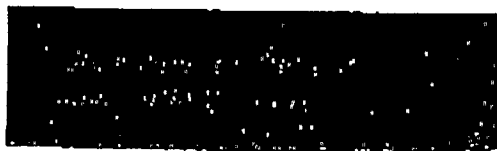
To: Ms. Deborah Booth Fax: (202)-366-3012
From: CAROL BONNER Date: 4/3/2001
Re: Picture of Final product Pages: 6 (including cover)

☐ Urgent ☒ For Review ☐ Please Comment ☐ Please Reply ☐ Please Recycle

Attached are the pictures of the crates.
Also Attached is ~~the~~ picture of final product.
Please call if there are additional covers

NORCOLD

.....



NORCOLD INC.

For over forty years, Norcold has provided alternate energy refrigeration to our customers. Our customers are the innovators in the recreational vehicle, marine and trucking industries.

We have over 400 employees, with ISO 9001 Certified manufacturing facilities in Gettysburg, Ohio and Sidney, Ohio.

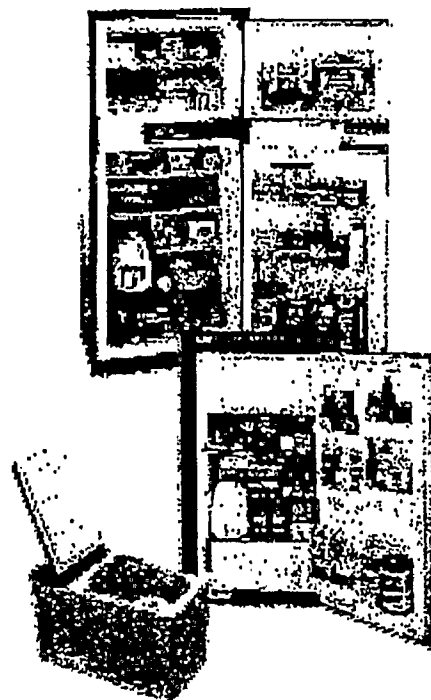
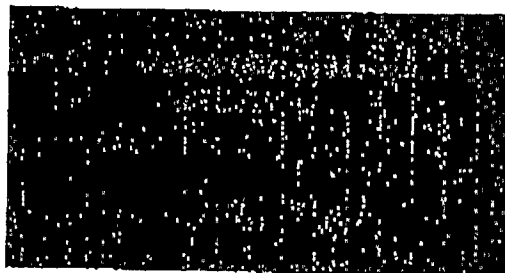
OUR PRODUCTS

Norcold offers a complete lineup of the finest recreational refrigerators available.

Quality and performance are evident in every step of the manufacturing process.

Norcold refrigerators are:

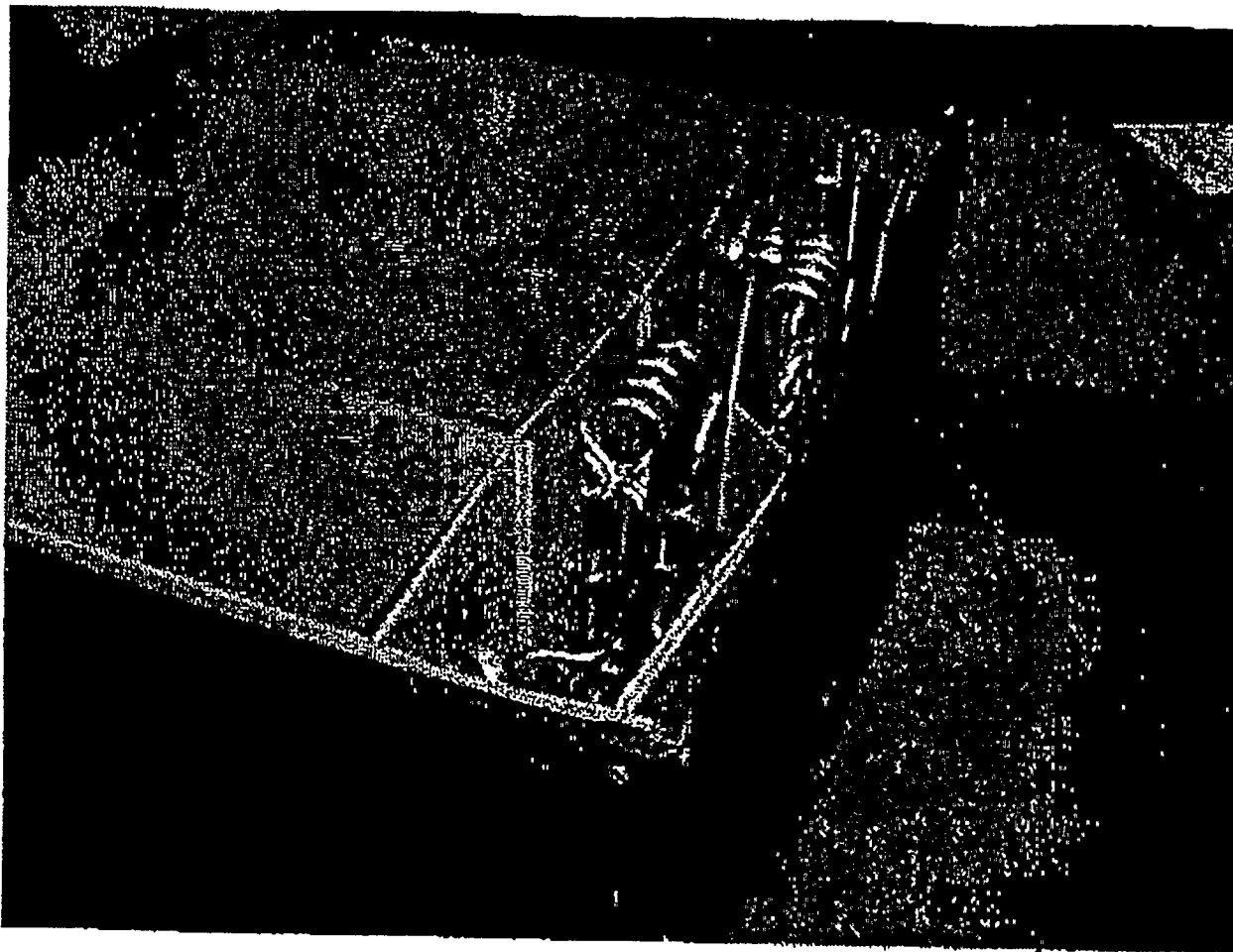
- * Designed with input from our users.
- * Built to take the rigors of travel.
- * Solidly backed by Norcold.

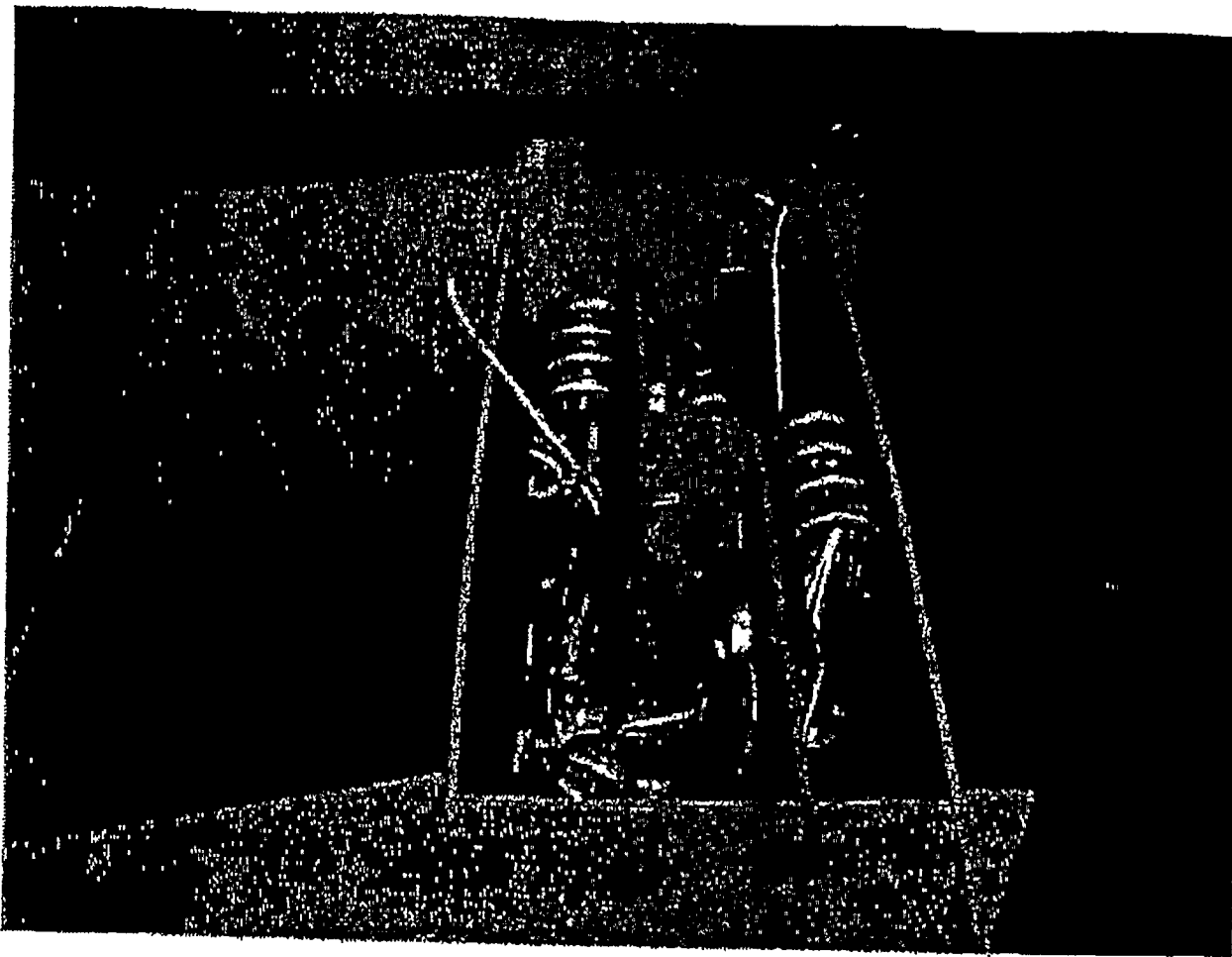


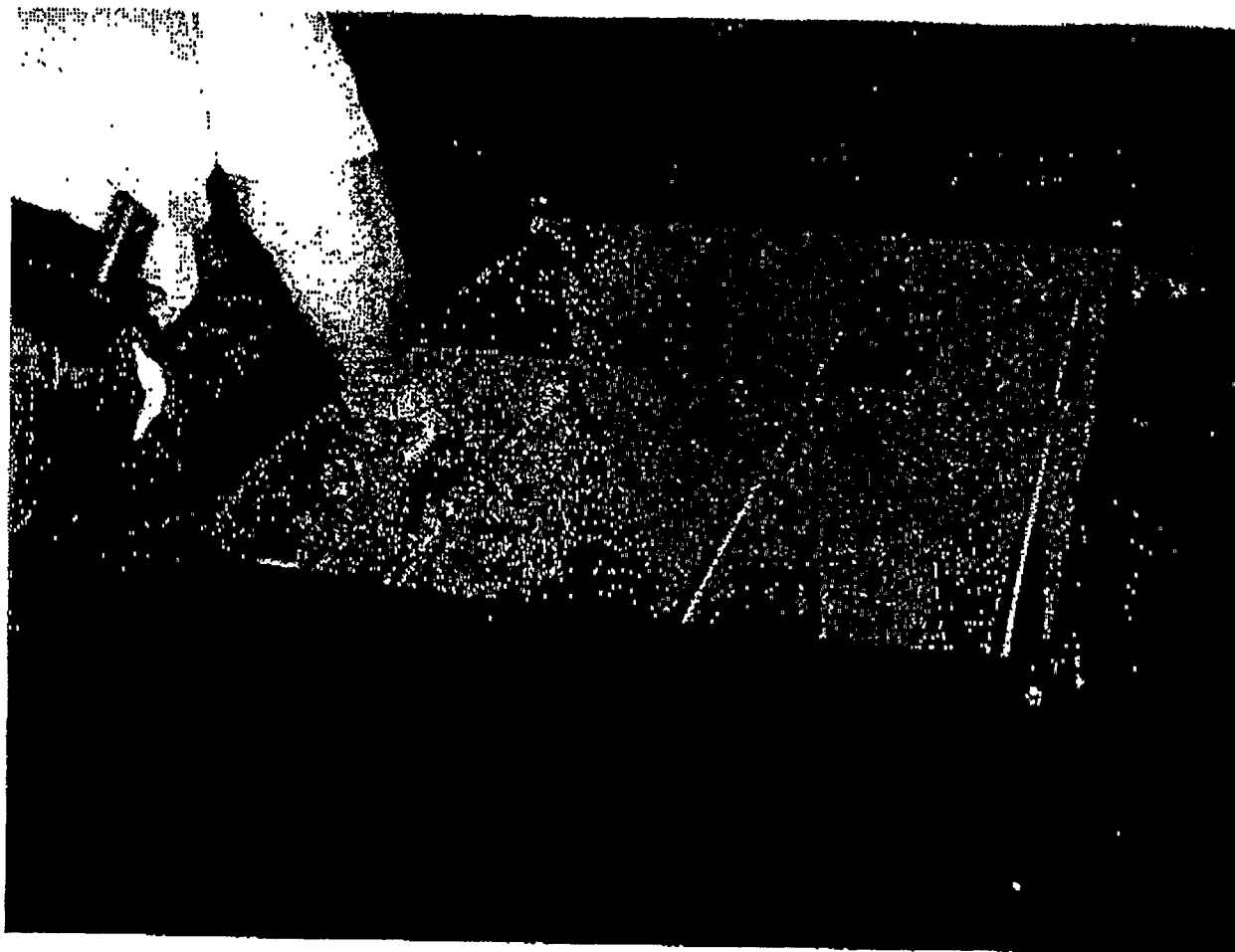
An Equal Opportunity Employer

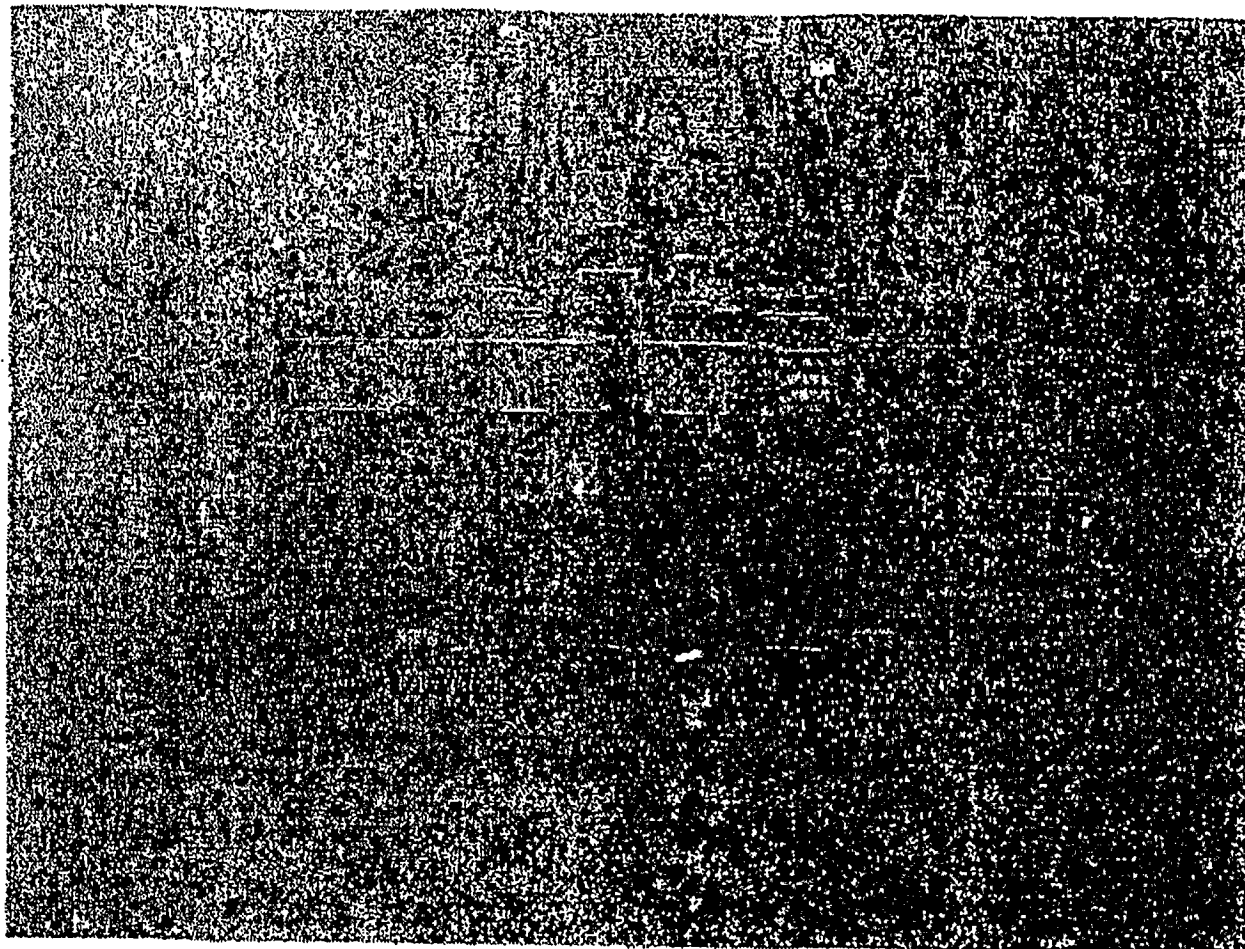


Norcold Inc.
600 South Kuther Rd
Sidney, OH 45365
Phone (937) 497-3080
Fax (937) 497-3085
www.norcold.com











Norcold Inc.
One Century Drive
P. O. Box 295
Gettysburg OH 45328
Phone - (937) 447-2241
(937) 497-3073
Fax - (937) 497-3074

To: Deborah Booth Fax: 202-366-3012
From: Carol Bonner Date: _____
Re: DOT question Pages: _____
Additional information.

☐ Urgent ☒ For Review ☐ Please Comment ☐ Please Reply ☐ Please Recycle

Attached is a copy of our Packaging
Certifications.

NORCOLD



To: Jim Liggett

From: Chery Branscum
Packaging Engineer

Subject: UN Testing Reports

Date: January 6, 1995

Here is a copy of the UN testing results performed by g/h Testing Lab in Cincinnati. These testing reports are required for persons shipping hazardous materials. These reports must be kept on file according to DOT regulation CFR 49 § 178.602 starting with paragraph (k). I have attached a copy for your information.

If you have any questions please give myself (6954) or Steve Fogle (6728) a call.

Thanks,


Chery

c: Steve Fogle
Fritz Serr

§ 178.602

49 CFR Ch. I (10-1-93 Edition)

lective testing of packagings that differ only in minor respects from a tested type.

(h) *Approval of equivalent packagings.* A packaging having specifications different from those in §§ 178.504-178.523 of this part, or which is tested using methods or test intervals, other than those specified in subpart M of this part, may be used if approved by the Associate Administrator for Hazardous Materials Safety. Such packagings must be shown to be equally effective, and testing methods used must be equivalent.

(i) *Proof of compliance.* Notwithstanding the periodic retest intervals specified in paragraph (e) of this section, the Associate Administrator for Hazardous Materials Safety may at any time require demonstration of compliance by a manufacturer, through testing in accordance with this subpart, that packagings meet the requirements of this subpart. As required by the Associate Administrator for Hazardous Materials Safety, the manufacturer shall either—

(1) Conduct performance tests, or have tests conducted by an independent testing facility, in accordance with this subpart; or

(2) Supply packagings, in quantities sufficient to conduct tests in accordance with this subpart, to the Associate Administrator for Hazardous Materials Safety or a designated representative of the Associate Administrator.

(j) *Coatings.* If an inner treatment or coating of a packaging is required for safety reasons, the manufacturer shall design the packaging so that the treatment or coating retains its protective properties even after withstanding the tests prescribed by this subpart.

(k) *Record retention.* The person who certifies the tested design type shall—

(1) Keep records of design qualification tests, including specific types, dates, locations, packaging specifications, test specifics (drop heights, hydrostatic pressures, etc.), results, and test operators' names or name of person responsible for testing, for each packaging, at each location where that packaging is manufactured and at each location where design qualification tests are conducted, as long as the

packaging is produced and for at least two years thereafter.

(2) Keep records of periodic retests, including specific types, dates, locations, packaging specifications, test specifics (drop heights, hydrostatic pressures, etc.), results, and test operators' names or name of person responsible for testing, at each location where that packaging is manufactured and at each location where periodic tests are conducted, until such tests are successfully performed again and for at least two years from the date of each test; and

(3) Make all records of design qualification tests and periodic retests available for inspection by a representative of the Department upon request.

[Amdt. 178-97, 56 FR 52723, Dec. 21, 1990, as amended at 56 FR 66285, Dec. 20, 1991; 57 FR 45465, Oct. 1, 1992]

§ 178.602 Preparation of packagings and packages for testing.

(a) Except as otherwise provided in this subchapter, each packaging and package must be closed in preparation for testing and tests must be carried out in the same manner as if prepared for transportation, including inner packagings in the case of combination packagings.

(b) For the drop and stacking test, inner and single-unit receptacles must be filled to not less than 95 percent of maximum capacity (see § 171.8 of this subchapter) in the case of solids and not less than 98 percent of maximum capacity in the case of liquids. The material to be transported in the packagings may be replaced by a non-hazardous material, except for chemical compatibility testing or where this would invalidate the results of the tests.

(c) If the material to be transported is replaced for test purposes by a non-hazardous material, the material used must be of the same or higher specific gravity as the material to be carried, and its other physical properties (grain, size, viscosity) which might influence the results of the required tests must correspond as closely as possible to those of the hazardous material to be transported. Water may also be used for the liquid drop test under the conditions specified in § 178.603(d)(2) of this



Package &
Product
Testing and
Consulting, Inc.

11440 Rockfield Court
Cincinnati, OH 45241
(513) 772-6669
Fax: (513) 772-6709

TO: Mrs. Chery Branscum
Packaging Engineer
Norcold, An Alcoa Company
600 S. Kuther Road
Sidney, Ohio 45365

DATE: October 31, 1994

FROM: Mr. Bernhard Bieri, III
Laboratory Manager
gh Package/Product Testing & Consulting, Inc.

SUBJECT: United Nations Hazardous Materials Testing and
Certification for Packaged Norcold Refrigeration Systems
UN2672 Corrosive - 4G Combination Pack Group III.

Dear Mrs. Branscum,

The attached provides a UN Certification and test report of
conducted UN Testing with results on subject UN2672 4G Combination
Packs.

These packs were subjected to vibration, free fall drops, cobb
moisture and stacking (compression) testing per UN Test
Specifications. Details of specific procedures and test
conditions/results are provided in the attached report.

Please review the attached report and, should you have questions
regarding its contents or testing, please contact me here at gh
Testing and Consulting, Inc. An invoice for services rendered is
attached to this report.

It was a pleasure working with you and I look forward to working
with you in the near future.

Yours Truly,

A handwritten signature in cursive script, reading 'Bernhard Bieri, III', written in dark ink.

Mr. Bernhard Bieri, III
Laboratory Manager
gh Package/Product Testing & Consulting, Inc.

Attachments

BB/rg



Package &
Product
Testing and
Consulting, Inc.

11440 Rockfield Court
Cincinnati, OH 45241
(513) 772-6669
Fax: (513) 772-6709

UNITED NATIONS PACKAGING CERTIFICATION (Per CFR 49)

DATE: October 31, 1994

CERTIFICATION NO. USA/+AP0758

U.N. CERTIFICATION REQUESTOR: Norcold, A Alcoa Co.
600 S. Kuther Road
P.O. Box 180
Sidney, Ohio 45365

ATTEN: Mrs. Chery Branscum

PACKAGING CERTIFICATION IDENTIFICATION AGENCY SA-890601

gh Package/Product Testing & Consulting, Inc.
11440 Rockfield Court
Cincinnati, Ohio 45241
(513) 772-6669

XXXXXX PASSENGER AIR

 CARGO AIR

 SURFACE SHIPMENT ONLY

TEST PURPOSE

The purpose of this testing conducted on subject UN2672 Hazardous Materials packaging was to qualify/certify this packaging based on United Nations Test Requirements for Packaging Group III Criteria. The package products are listed as UN2672 (Corrosive) in an 4G Combination Package (4 Pack Types - Gaylord Containers).

TEST PROCEDURES

The Test Procedures/Standards utilized for the testing of this pack is described below: Pack was subjected to specified test as established in United States Code of Federal Regulation - Section 49 - Subchapter C - Hazardous Materials Regulations - Parts 100 to 199.

TEST SPECIMEN DESCRIPTION

Models 48, 68, 68IM and 618 (2 way & 3 way) - Gross Weight 149 lbs. (68 Kg):

1. Inner (Primary Pack): NA10 Refrigerant System Part #61687337. Mfg.: Arctek Corp., Gettysburg, Ohio.
2. Outer Pack: (1) Outside Container - Part #61747622: 275 lb. test C Flute, Size: 26" x 26" x 61.12" I.D. - Grade 69-26-69 - Glue HL-7262X - Separable for recycling, basiloid top, gap bottom - Per Drawing C17476. Manufactured by Gaylord Container, Marion, Ohio - supplied by Derby Packaging, Sidney, Ohio.
3. One (1) Bottom Pad, Part #61631822, 350 lb. test Doublewall, B/C Flute - Blank Size: 33.625" x 33.625" - Grade 42-26-42-26-42, Glue HL-7262X - Separable for recycling - Die cut pad - two honeycomb pieces 3 x 17 x 1.125, Per Drawing C16318. Manufactured by Akers Packaging, Middletown, Ohio and Mid States, DeGraff, Ohio - supplied by Derby Packaging, Sidney, Ohio.
4. One (1) Top Pad, Part #61681322: 350 lb. test doublewall B/C Flute - Blank Size: 33.625" x 33.625". Grade 42-26-42-26-42 - Glue HL-7262X - Separable for recycling - Die cut pad - two honeycomb pieces 3 x 22.25 x 1.125, - two honeycomb pieces 3 x 17 x 1.125. Per drawing C16813. Manufactured by Akers Packaging, Middletown, Ohio and Mid States, DeGraff, Ohio - supplied by Derby Packaging, Sidney, Ohio.

Page 2 of UN Certification

5. Two Spacers Part #617888:
200 lb. singlewall C Flute - Blank Size: 14 x 6.75". Grade 33-26-33 per drawing B17888. Manufactured by Akers Packaging, Middletown, Ohio - supplied by Derby Packaging, Sidney, Ohio.
6. Two (2) Corner Protectors Part #61607322:
200 lb. doublewall B/C Flute - Blank Size: 43.75 x 9.75".
Grade 33-26-26-26-33 - Glue HL-7262X - Separable for recycling
- Two honeycomb pieces 3 x 22.25 x 1.125" per drawing B16073
Manufactured by Akers Packaging, Middletown, Ohio and Mid States, DeGraff, Ohio - supplied by Derby Packaging, Sidney, Ohio.

TESTING ANALYSIS AND RESULTS

Upon completion of testing, each test specimen was reviewed for damage and leakage. Pack met required vibration, cobb, drop tests, and stacking tests. Above UN Pack is considered meeting required UN Testing Criteria for Group III.

CERTIFICATION APPROVED BY:

Mr. Bernhard Bieri, III *Bernhard Bieri*

AGENCY: gh Package/Product Testing
& Consulting, Inc.
11440 Rockfield Court
Cincinnati, Ohio 45241

CERT. NUMBER
UN/4G/Z68/S/94
USA/+APO758



Package &
Product
Testing and
Consulting, Inc.

11440 Rockfield Court
Cincinnati, OH 45241
(513) 772-6669
Fax: (513) 772-6709

Norcold Incorporated
United Nations Testing of Hazardous Material
Test Report
October 31, 1994

TEST PURPOSE

The purpose of this testing conducted on subject UN2672 Hazardous Materials packaging was to qualify/certify this packaging based on United Nations Test Requirements for Packaging Group III Criteria. The package products are listed as UN2672 (Corrosive) in a 4G Combination Package (4 Pack Types).

DATE(S) TESTS CONDUCTED

October 27, 28, and 31, 1994

PERSONNEL PRESENT DURING TESTING

Mr. Gerald A. Hock CP-P, President & Technical Director, gh Package/Product Testing & Consulting, Inc.
Mr. Bernhard H. Bieri, III., Laboratory Manager, gh Package/Product Testing & Consulting, Inc.

SITE OF TESTING

gh Package/Product Testing & Consulting, Inc.
11440 Rockfield Court
Cincinnati, Ohio 45241

LABORATORY TEMPERATURE AND RELATIVE HUMIDITY

73 Degrees (F) at 50% R.H.

TEST EQUIPMENT

The equipment available to conduct dynamic testing defined in this report is detailed in ATTACHMENT "A-1" at the rear of this document.

TEST PROCEDURES

The following test procedures were those designated by United Nations for testing and were utilized during material and package testing.

UN Combination Pack - 4G - UN2672 "Corrosive" Packing Group III.

Norcold
Page 2

Test Standard: A.S.T.M. D4919-89 entitled "Standard Specification for testing of Hazardous Materials Packaging".

1. Conditioning - Subject packs to standard conditions at 73 degrees (F) at 50% R.H. for a period of 72 hours prior to testing.

2. Water Resistance Test (cobb method) T.A.P.P.I. T441: Subject corrugated container board to thirty (30) minutes exposure to water. Determine if the sample absorption is greater than 155 g/meter².

3. Subject five (5) filled combination packages to five free fall impacts. Packing Group III drop height shall be 0.8 meters (32 inches) above impact area.

Test five (5) packs, one for each drop, conditioned in accordance with #1. Drop individual packs flat on bottom, top, one long side, one short side. Drop box diagonally on the manufacturer's joint bottom corner (5-2-3- corner). Perform drop tests in accordance with Test Method D775.

4. Subject five (5) filled packages (drop test packs) to vibration testing at an input of 1.1 g at 4 Hertz for a period of sixty (60) minutes.

5. Stacking (compression) Testing - Subject three separate filled packs to a stacking load equivalent to a height of three (3) meters for a period of twenty four hours.

6. Basis Weight: T.A.P.P.I. Method T-410 entitled "Grammage of Paper and Paperboard".

7. Caliper: T.A.P.P.I. Method T-411 entitled "Thickness of Paper and Paperboard".

Review all packages and containers prior to and following testing for acceptance.

Norcold
Page 3PACKAGE DESCRIPTIONS

Models 44 (2 way & 3 way*) - Gross Weight 87 lbs. (40 Kg):

1. Inner (Primary Pack): NA4 Refrigerant System Part #61687037.
Mfg.: Arctek Corp., Gettysburg, Ohio
2. Outer Pack: (1) Outside Container - Part #61747322:
Outside Container: 275 lb. test C Flute, Size: 26" x 26" x 32.63 I.D. - Grade 69-26-69 - Glue HL-7262X - Separable for recycling, basiloid top, gap bottom - Per Drawing C17473.
Manufactured by Gaylord Container, Marion, Ohio, supplied by Derby Packaging, Sidney, Ohio
3. One (1) Bottom Pad Part #61631822:
350 lb. test doublewall B/C Flute - Blank Size: 33.625" x 33.625". Grade 42-26-42-26-42 - Glue HL-7262X - Separable for recycling, die cut pad - two honeycomb pieces. Size: 3 x 17 x 1.125" per drawing C16318. Manufactured by Akers Packaging, Middletown, Ohio and Mid States, Degraff, Ohio - supplied by Derby Packaging, Sidney, Ohio.
4. One (1) Top Pad Part # 61681322:
350 lb. test doublewall B/C Flute - Blank Size: 33.625" x 33.625". Grade 42-26-42-26-42 - Glue HL-7262X - Separable for recycling - Die cut pad - two honeycomb pieces 3 x 22.25 x 1.125, two honeycomb pieces 3 x 17 x 1.125" per drawing C16813. Manufactured by Akers Packaging, Middletown, Ohio and Mid States, Degraff, Ohio - supplied by Derby Packaging, Sidney, Ohio.
5. Two Spacers Part # 617888:
200 lb. singlewall C Flute - Blank Size: 14 x 6.75". Grade 33-26-33 per drawing B17888. Manufactured by Akers Packaging, Middletown, Ohio - supplied by Derby Packaging, Sidney, Ohio.
6. Two (2) Corner Protectors Part #61667422:
Corner Protector - 200 lb. doublewall B/C Flute - Blank Size: 17.00 x 9.75". Grade 33-26-26-26-33 - Glue HL-7262X - Separable for recycling - One honeycomb piece 3 x 17 x 1.125" per drawing B16674. Manufactured by Akers Packaging, Middletown, Ohio and Mid States, Degraff, Ohio - supplied by Derby Packaging, Sidney, Ohio

Models 45, 65, 605 (2 way & 3 way) - Gross Weight 107 lbs. (49 kg):

1. Inner (Primary Pack): NA6 Refrigerant System Part #61687137.
Mfg.: Arctek Corp., Gettysburg, Ohio

Norcold

Page 4

2. Outer Pack: One (1) Outside Container Part # 61747422:
275 lb test C Flute - Size: 26 x 26 x 44.25 I.D.
Grade 69-26-69, Glue HL-7262X - Separable for recycling -
basiloid top, gap bottom. Per drawing C17474. Manufactured by
Gaylord Container, Marion, Ohio - supplied by Derby Packaging,
Sidney, Ohio.
3. One (1) Bottom Pad, Part # 61631822:
350 lb. test doublewall B/C Flute - Blank Size: 33.625" x
33.625". Grade 42-26-42-26-42 - Glue HL-7262X separable for
recycling - die cut pad - two honeycomb pieces 3" x 17" x
1.125", Per drawing C16318. Manufactured by Akers Packaging,
Middletown, Ohio and Mid States, DeGraff, Ohio - supplied by
Derby Packaging, Sidney, Ohio.
4. One (1) Top Pad, Part #61681322:
350 lb. test doublewall B/C Flute - Blank Size: 33.625 x
33.625. Grade 42-26-42-26-42 - Glue HL-7262X - Separable for
recycling - Die cut pad - two honeycomb pieces 3 x 22.25 x
1.125" - two honeycomb pieces 3 x 17 x 1.125 - Per drawing
C16813. Manufactured by Akers Packaging, Middletown, Ohio and
Mid States, DeGraff, Ohio - supplied by Derby Packaging,
Sidney, Ohio.
5. Two (2) Spacers, Part #617888:
200 lb. singlewall C Flute - Blank Size: 14 x 6.75 - Grade 33-
26-33 Per Drawing B17888. Manufactured by Akers Packaging,
Middletown, Ohio - supplied by Derby Packaging, Sidney, Ohio.
6. Two (2) Corner Protectors, Part #61624822:
200 lb. doublewall B/C Flute - Blank Size: 33.50 x 9.75" -
Grade 33-26-26-26-33 - Glue HL-7262X separable for recycling -
one honeycomb piece 3 x 22.25 x 1.125 per drawing B16248.
Manufactured by Akers Packaging, Middletown, Ohio and Mid
States, DeGraff, Ohio - supplied by Derby Packaging, Sidney,
Ohio.

Models 46, 66, 66IM, and 616 (2 way & 3 way*) - Gross Weight -
143 lbs. (65 kg):

1. Inner (Primary Pack): NAB Refrigerant System Part #61687237.
Mfg.: Arctek Corp., Gettysburg, Ohio.
2. Outer Pack: (1) Outside Container, Part #61747522:
275 lb. test C Flute - Size: 26 x 26 x 54.12" I.D.
Grade 69-26-69 - Glue HL-7262X separable for recycling -
basiloid top, gap bottom. Per Drawing C17475. Manufactured by
Gaylord Container, Marion, Ohio - supplied by Derby Packaging,
Sidney, Ohio.

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Page 5

3. One (1) Bottom Pad, Part #61631822:
350 lb. test doublewall B/C Flute - Blank Size: 33.625 x 33.625" - Grade 42-26-42-26-42 - Glue HL-7262X separable for recycling - die cut pad - two honey comb pieces - Size: 3 x 17 x 1.125 - Per drawing C16318. Manufactured by Akers Packaging, Middletown, Ohio and Mid States, DeGraff, Ohio - supplied by Derby Packaging, Sidney, Ohio.
4. One (1) Top Pad, Part # 61681322:
350 lb. test doublewall B/C Flute - Blank Size: 33.625 x 33.625 - Grade 42-26-42-26-42 - Glue HL-7262X separable for recycling - die cut pad - two honeycomb pieces 3 x 22.25 x 1.125 - two honeycomb pieces 3 x 17 x 1.125. Per drawing C16813. Manufactured by Akers Packaging, Middletown, Ohio and Mid States, DeGraff, Ohio - supplied by Derby Packaging, Sidney, Ohio.
5. Two (2) Spacers, Part # 617888:
200 lb. singlewall C Flute - Blank Size: 14 x 6.75 - grade 33-26-33 - Per drawing B17888. Manufactured by Akers Packaging, Middletown, Ohio - supplied by Derby Packaging, Sidney, Ohio.
6. Two (2) Corner Protectors, Part # 61607322:
200 lb. doublewall B/C flute - Blank Size: 43.75 x 9.75 - Grade 33-26-26-26-33 - Glue HL-7262X separable for recycling - two honeycomb pieces 3 x 22.25 x 1.125 - Per drawing B16073. Manufactured by Akers Packaging, Middletown, Ohio and Mid States, DeGraff, Ohio - supplied by Derby Packaging, Sidney, Ohio.

Models 48, 68, 68IM, 618 (2 way & 3 way*) - Gross Wt. 149 lbs.
(68 kg):

1. Inner (Primary) Pack: NA10 Refrigerant System Part #61687337.
Mfg.: Arctek Corp., Gettysburg, Ohio.
2. Outer Pack: One (1) Outside Container Part #61747622:
275 lb. test C Flute - Size: 26 x 26 x 61.12" I.D.
Grade 69-26-69 - Glue HL-7262X separable for recycling - basiloid top, gap bottom - Per drawing C17476. Manufactured by Gaylord Container, Marion, Ohio - Supplied by Derby Packaging, Sidney, Ohio.
3. One (1) Bottom Pad, Part #61631822, 350 lb. test Doublewall, B/C Flute - Blank Size: 33.625" x 33.625" - Grade 42-26-42-26-42, Glue HL-7262X - Separable for recycling - Die cut pad - two honeycomb pieces 3 x 17 x 1.125, Per Drawing C16318. Manufactured by Akers Packaging, Middletown, Ohio and Mid States, DeGraff, Ohio - supplied by Derby Packaging, Sidney, Ohio.

Norcold
Page 6

4. One Top Pad, Part #61681322:
350 lb. test doublewall B/C Flute - Blank Size: 33.625 x 33.625
Grade 42-26-42-26-42 - Glue HL-7262X separable for recycling -
die cut pad - two honey comb pieces 3 x 22.25 x 1.125 -two
honeycomb pieces 3 x 17 x 1.125 - Per drawing C16813.
Manufactured by Akers Packaging, Middletown, Ohio and Mid
States, DeGraff, Ohio - supplied by Derby Packaging, Sidney,
Ohio.
5. Two (2) Spacers, Part # 617888:
200 lb. singlewall C Flute - Blank Size: 14 x 6.75 - Grade 33-
26-33 - Per drawing B17888. Manufactured by Akers Packaging,
Middletown, Ohio - supplied by Derby Packaging, Sidney, Ohio..
6. Two (2) Corner Protectors, Part #61607322:
200 lb. doublewall B/C Flute - Blank Size: 43.75 x 9.75 -
Grade 33-26-26-26-33 - Glue HL-7262X - separable for recycling
- two honeycomb pieces 3 x 22.25 x 1.125 - Per drawing B16073.
Manufactured by Akers Packaging, Middletown, Ohio and Mid
States, DeGraff, Ohio - supplied by Derby Packaging, Sidney,
Ohio.

*NOTE: The only difference between 2 way and 3 way is the 3 way
has DC Electric Capability - Both have gas and electric
systems.

TESTING RESULTS AND ANALYSIS

The results of conducted testing and condition of packages and
contents are provided below (Packing Group III):

a. Water Resistance Test (Cobb Method):
Five (5) corrugated container specimens were subjected to Cobb
(T.A.P.P.I. T441) tests. The water absorption cannot exceed 155
g/meter².

<u>Sample #</u>	<u>Models 442, 6052, 662, and 6182</u> <u>Gain in Moisture</u>	<u>Results</u>
1	125 g/m ²	Passed
2	115 g/m ²	Passed
3	98 g/m ²	Passed
4	111 g/m ²	Passed
5	107 g/m ²	Passed

b. Vibration Test:

Three (3) packages were subjected to one hour of vibration at an
input of 1.1 g at 4 Hertz.

Results: All packs were in good condition with no leakage
following testing.

Norcold
Page 7

c. Drop Test:

Three (3) packs were subjected to drop testing from a height of 0.8 meters (32 inches) in the orientation listed below:

<u>Models #442, #6052, #662, and #6182</u>		
<u>Drop #</u>	<u>Orientation</u>	<u>Results</u>
1	Bottom (flat)	Passed
2	Top (flat)	Passed
3	Long Side (flat)	Passed
4	Short Side-End (flat)	Passed
5	Diagonally (M.F.J.) Corner	Passed

d. Stacking (compression) Test: Subject three (3) loaded containers to a comparable load of three meters high (or greater) for a period of twenty four (24) hours.

(Previously tested - Multiple dates - Passed)

e. Carton Material Analysis:

	<u>Basis Weight</u> <u>(lbs./MSF)</u>	<u>Caliper</u> <u>(inches)</u>	<u>Combined Board</u> <u>(Mullen Test)</u>
Inside Liner	71.00	0.0220	445
1st Medium	31.00	0.0090	
Outside Liner	71.00	0.0230	

UN MARKINGS

The assigned UN Markings shall read as follows:

Model 44 (2 way & 3 way)

Models 45, 65, & 605 (2 way & 3 way)

UN/4G/Z40/S/94
USA/+APO755

UN/4G/Z49/S/94
USA/+APO756

ATTACHMENT A-1

Vibration:

A. Sonic Electro-Hydraulic Vibration System including sine wave and Random Capabilities. System includes two Accelerometers, a Vibration Meter, two Endevco Time Base/Amplifier and a Tektronix 500 Series Dual Channel Oscilloscope. Vibration System also includes a Mavotek Model 105 Sine Generator, an H.P. X-Y Plotter and a D.D.S. Storage & Transient Waveform Recorder. System can produce Single or dated Individual Shock Impact Pulses. Hard copy Sine and Random Wave Forms Computer produced.

B. LAB Transportation Simulator - 4000 SHK - Capacity 4000 lbs. Circular Synchronous, Synchronous 30" out of phase, Vortical-Linear, Non Synchronous Motions. Basic Table Size: 5' x 6'.

C. Drop/Shocks:

*Frog Fall Split Leaf Adjustable Drop Tester - 300 lbs. capacity with foot activated Drop Leaf Control. Hard copy Shock Waveforms Computer produced.

*Incline/Impact Ten Foot 300 lbs. Capacity Vectorial Shock Induced with Manual Preset Sled Release. Velocity at Impact is registered using a G.H. 1 Photocell Velocimeter with an Oscilloscope Sync INP Input. Test capability up to 0 MPH. Hard copy Shock Wave Form Computer Generated.

*Transmont Model 65/81 Shock Testing Machine with variable impact programmer, and a 450 lb. impact mounting table. The system will produce a nominal two millisecond $q/2$ sine shock pulse up to 600 g's and rectangular wave pulses with durations to 65 milliseconds $1/2$ sine shock pulse up to 60 g's and rectangular wave pulses with durations to 65 milliseconds and velocity change to 25 ft./sec.

*Overhead "I" Beam Large Capacity Drop Testing 13000 lb. and includes a quick release apparatus with slings for large and heavy Free Fall Impact Testing.

*Cushion Impact Tester (low to high static stress loadings) capable of 40" impact on a cushion specimen size of 0" x 8". Impact head for Foam in Place Dynamic Testing.

*Compression Tester - Three Stage Programmable 30,000 lb. capability with four (4) variable load settings. Platen size is 60 inch opening by 72 inches. The apparatus has a fixed/floating crosshead capability with deflection measurement device. System includes an Autographic Chart Recorder.

*Tektronics 25 Megahertz Dual Trace Storage Oscilloscope with an Endevco Model 2775A Shock Amplifier and Accelerometer. This system is used to capture Shock Data on Drop Tester, Incline/Impact Tester and the Vibration Tester.

Transmont - Test Partner - Three Channel Recording

*I.S.T. Computer Compatible Shock "Box" Capture Unit. Captures Vibration, Shock, Temperature, Humidity and is linked to an IBM Turbo XT Computer. Capable of both Internal or External Capture.

*Three (3) Temperature/Conditioning Chambers Temperature and Relative Humidity projected to produce 35 to 140 Degrees (F) and 30 to 90% Relative Humidity. Additional Chamber can produce -30 to 16" (F).



Markings

Each packaging that is manufactured and tested in accordance with the performance oriented packaging standards of HM-181 must include a marking on the

packaging which indicates that the packaging has been UN tested. The next section describes each portion of the UN marking and what it means.

Example of UN Marking for Solid Hazardous Materials Single or Composite Packagings or Combination Packagings for All Materials



UN Symbol

Gross Mass In Kilograms
4G/X 3 / S / 94/USA/ M0000

Packaging Identification Code

Packing Group Level Equivalent

Solids Or Inner Packagings

Year Of Manufacture

Location Of Manufacture

Certification Mark/ Manufacturer's Symbol

Example of UN Marking for Liquid Hazardous Materials Single or Composite Packaging




1A1/X1.5/250/94/USA/+AA0000

Specific Gravity

Hydrostatic Test Pressure


United Nations Symbol


 4G/X 3 / S / 94/USA/ M0000

 1A1/X1.5/250/94/USA/+AA0000

The UN in the circle indicates that this packaging has been UN tested and certified.

Packaging Identification Codes

 4G/X 3 / S / 94/USA/ M0000

 1A1/X1.5/250/94/USA/+AA0000

This number/letter combination indicates the type of packaging and material of construction. The chart listed below shows what each letter and number combination would mean.

Packaging Identification Codes	
Numeral (1-7)=Type of Packaging	
1=Drum	2=Wooden Barrel
3=Jerrican	4=Box
5=Bag	6=Composite Packaging
7=Pressure Receptacle	
Capital Letter=Construction Material	
A=Steel	B=Aluminum
C=Natural Wood	D=Plywood
F=Reconstituted Wood	G=Fiberboard
H=Plastic	L=Textile
M=Paper, multi-wall	N=Other Metal
P=Glass, Porcelain, Stoneware	
Number=Sub-Category of Packaging	
For Drums: 1=Nonremovable Head	2=Removable Head
For Bags: 5M1=Multi-wall bags	5M2=Multi-walled, water resistant bag

Any one of the following three styles represents an example of the kind of packaging identification code that may be shown on a UN packaging.

1) There may be a number-letter combination indicating a type of packaging and material of construction. For example:

4G = Fiberboard box

2D = Plywood wooden barrel

2) There may be a number-letter-number combination indicating the type of packaging, material of construction and a subcategory within the type of packaging (See 49CFR part 178.500 for subcategories). For example:

1A1 = Nonremovable head steel drum

5M2 = Multi-walled, water resistant paper bag



Package &
Product
Testing and
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11440 Rockfield Court
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(513) 772-6669
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UNITED NATIONS PACKAGING CERTIFICATION (Per CFR 49)

DATE: October 31, 1994

CERTIFICATION NO. USA/+AP0755

U.N. CERTIFICATION REQUESTOR:

Norcold, A Alcoa Co.

600 S. Kuther Road

P.O. Box 180

Sidney, Ohio 45365

ATTEN: Mrs. Chery Branscum

PACKAGING CERTIFICATION IDENTIFICATION AGENCY

SA-890601

gh Package/Product Testing & Consulting, Inc.

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Cincinnati, Ohio 45241

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XXXXXX PASSENGER AIR

 CARGO AIR

 SURFACE SHIPMENT ONLY

TEST PURPOSE

The purpose of this testing conducted on subject UN2672 Hazardous Materials packaging was to qualify/certify this packaging based on United Nations Test Requirements for Packaging Group III Criteria. The package products are listed as UN2672 (Corrosive) in an 4G Combination Package (4 Pack Types - Gaylord Containers).

TEST PROCEDURES

The Test Procedures/Standards utilized for the testing of this pack is described below: Pack was subjected to specified test as established in United States Code of Federal Regulation - Section 49 - Subchapter C - Hazardous Materials Regulations - Parts 100 to 199.

TEST SPECIMEN DESCRIPTION

Models 44 (2 way & 3 way) - Gross Weight 87 lbs. (40 Kg):

1. Inner (Primary Pack): NA4 Refrigerant System Part #61687037.
Mfg.: Arctek Corp., Gettysburg, Ohio
2. Outer Pack: (1) Outside Container - Part #61747322:
Outside Container: 275 lb. test C Flute, Size: 26" x 26" x 32.63 I.D. - Grade 69-26-69 - Glue HL-7262X - Separable for recycling, basiloid top, gap bottom - Per Drawing C17473.
Manufactured by Gaylord Container, Marion, Ohio - supplied by Derby Packaging, Sidney, Ohio.
3. One (1) Bottom Pad Part #61631822:
350 lb. test doublewall B/C Flute - Blank Size: 33.625" x 33.625". Grade 42-26-42-26-42 - Glue HL-7262X - Separable for recycling - Die cut pad - two honey comb pieces 3 x 17 x 1.125, Per Drawing C16318. Manufactured by Akers Packaging, Middletown, Ohio and Mid States, Degraff, Ohio - supplied by Derby Packaging, Sidney, Ohio.
4. One (1) Top Pad, Part #61681322:
350 lb. test doublewall B/C Flute - Blank Size: 33.625" x 33.625". Grade 42-26-42-26-42 - Glue HL-7262X - Separable for recycling - Die cut pad - two honeycomb pieces 3 x 22.25 x 1.125, two honeycomb pieces 3 x 17 x 1.125" per drawing C16813. Manufactured by Akers Packaging, Middletown, Ohio and Mid States, Degraff, Ohio - supplied by Derby Packaging, Sidney, Ohio.

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5. Two Spacers Part #617888:
200 lb. singlewall C Flute - Blank Size: 14 x 6.75". Grade 33-26-33 per drawing B17888. Manufactured by Akers Packaging, Middletown, Ohio - supplied by Derby Packaging, Sidney, Ohio.
6. Two (2) Corner Protectors Part #61667422:
Corner Protector - 200 lb. doublewall B/C Flute - Blank Size: 17.00 x 9.75". Grade 33-26-26-26-33 - Glue HL-7262X - Separable for recycling - One honeycomb piece 3 x 17 x 1.125" per drawing B15574. Manufactured by Akers Packaging, Middletown, Ohio and Mid States, Degraff, Ohio - supplied by Derby Packaging, Sidney, Ohio.

TESTING ANALYSIS AND RESULTS

Upon completion of testing, each test specimen was reviewed for damage and leakage. Pack met required vibration, cobb, drop tests, and stacking tests. Above UN Pack is considered meeting required UN Testing Criteria for Group III.

CERTIFICATION APPROVED BY:

Mr. Bernhard Bieri, III *Bernhard Bieri*
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CERT. NUMBER
UN/4G/Z40/S/94
USA/+APO755



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UNITED NATIONS PACKAGING CERTIFICATION (Per CFR 49)

DATE: October 31, 1994

CERTIFICATION NO. USA/4AP0756

U.N. CERTIFICATION REQUESTOR: Norcold, A Alcoa Co.
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XXXXXX PASSENGER AIR
CARGO AIR
SURFACE SHIPMENT ONLY

TEST PURPOSE

The purpose of this testing conducted on subject UN2672 Hazardous Materials packaging was to qualify/certify this packaging based on United Nations Test Requirements for Packaging Group III Criteria. The package products are listed as UN2672 (Corrosive) in an 4G Combination Package (4 Pack Types - Gaylord Containers).

TEST PROCEDURES

The Test Procedures/Standards utilized for the testing of this pack is described below: Pack was subjected to specified test as established in United States Code of Federal Regulation - Section 49 - Subchapter C - Hazardous Materials Regulations - Parts 100 to 199.

TEST SPECIMEN DESCRIPTION

Models 45, 65, 605 (2 way & 3 way) - Gross Weight 107 lbs. (49 Kg):

1. Inner (Primary Pack): NA6 Refrigerant System Part #61687137.
Mfg.: Arctek Corp., Gettysburg, Ohio.
2. Outer Pack: (1) Outside Container - Part #61747422:
275 lb. test C Flute, Size: 26" x 26" x 44.25 I.D. -
Grade 69-26-69 - Glue HL-7262X - Separable for recycling,
basiloid top, gap bottom - Per Drawing C17474. Manufactured
by Gaylord Container, Marion, Ohio - supplied by Derby
Packaging, Sidney, Ohio.
3. One (1) Bottom Pad Part #61631822:
350 lb. test doublewall B/C Flute - Blank Size: 33.625" x
33.625". Grade 42-26-42-26-42 - Glue HL-7262X - Separable for
recycling - Die cut pad - two honeycomb pieces 3" x 17" x
1.125", Per drawing C16318. Manufactured by Akers Packaging,
Middletown, Ohio and Mid States, DeGraff, Ohio - supplied by
Derby Packaging, Sidney, Ohio.
4. One (1) Top Pad, Part #61681322:
350 lb. test doublewall B/C Flute - Blank Size: 33.625" x
33.625". Grade 42-26-42-26-42 - Glue HL-7262X - Separable for
recycling - Die cut pad - two honeycomb pieces 3 x 22.25 x
1.125, two honeycomb pieces 3 x 17 x 1.125" per drawing C16813.
Manufactured by Akers Packaging, Middletown, Ohio and Mid
States, DeGraff, Ohio - supplied by Derby Packaging, Sidney,
Ohio.

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5. Two Spacers Part #617888:
200 lb. singlewall C Flute - Blank Size: 14 x 6.75". Grade 33-26-33 per drawing B17888. Manufactured by Akers Packaging, Middletown, Ohio - supplied by Derby Packaging, Sidney, Ohio.
6. Two (2) Corner Protectors Part #61624822:
200 lb. doublewall B/C Flute - Blank Size: 33.50" x 9.75".
Grade 33-26-26-26-33 - Glue HL-7262X - Separable for recycling
- One honeycomb piece 3 x 22.25 x 1.125" per drawing B16248.
Manufactured by Akers Packaging, Middletown, Ohio and Mid States, DeGraff, Ohio - supplied by Derby Packaging, Sidney, Ohio.

TESTING ANALYSIS AND RESULTS

Upon completion of testing, each test specimen was reviewed for damage and leakage. Pack met required vibration, cobb, drop tests, and stacking tests. Above UN Pack is considered meeting required UN Testing Criteria for Group III.

CERTIFICATION APPROVED BY:

Mr. Bernhard Bierl, III *Bernhard Bierl III*
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CERT. NUMBER
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UNITED NATIONS PACKAGING CERTIFICATION (Per CFR 49)

DATE: October 31, 1994

CERTIFICATION NO. USA/+AP0757

U.N. CERTIFICATION REQUESTOR: Norcold, A Alcoa Co.
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XXXXXX PASSENGER AIR

 CARGO AIR

 SURFACE SHIPMENT ONLY

TEST PURPOSE

The purpose of this testing conducted on subject UN2672 Hazardous Materials packaging was to qualify/certify this packaging based on United Nations Test Requirements for Packaging Group III Criteria. The package products are listed as UN2672 (Corrosive) in an 4G Combination Package (4 Pack Types - Gaylord Containers).

TEST PROCEDURES

The Test Procedures/Standards utilized for the testing of this pack is described below: Pack was subjected to specified test as established in United States Code of Federal Regulation - Section 49 - Subchapter C - Hazardous Materials Regulations - Parts 100 to 199.

TEST SPECIMEN DESCRIPTION

Models 46, 66, 66IM and 616 (2 way & 3 way) - Gross Weight 143 lbs. (65 Kg):

1. Inner (Primary Pack): NA8 Refrigerant System Part #61687237.
Mfg.: Arctek Corp., Gettysburg, Ohio.
2. Outer Pack: (1) Outside Container - Part #61747522:
275 lb. test C Flute, Size: 26" x 26" x 54.12 I.D. -
Grade 69-26-69 - Glue HL-7262X - Separable for recycling,
basiloid top, gap bottom - Per Drawing C17475. Manufactured
by Gaylord Container, Marion, Ohio - supplied by Derby
Packaging, Sidney, Ohio.
3. One (1) Bottom Pad Part #61631822:
350 lb. test doublewall B/C Flute - Blank Size: 33.625" x
33.625" - Grade 42-26-42-26-42 - Glue HL-7262X - Separable
for recycling - Die out pad - two honeycomb pieces - Size:
3 x 17 x 1.125 - Per drawing C16318. Manufactured by Akers
Packaging, Middletown, Ohio and Mid States, DeGraff, Ohio -
supplied by Derby Packaging, Sidney, Ohio.
4. One (1) Top Pad, Part #61681322:
350 lb. test doublewall B/C Flute - Blank Size: 33.625" x
33.625". Grade 42-26-42-26-42 - Glue HL-7262X - Separable for
recycling - Die cut pad - two honeycomb pieces 3 x 22.25 x
1.125, - two honeycomb pieces 3 x 17 x 1.125. Per drawing
C16813. Manufactured by Akers Packaging, Middletown, Ohio and
Mid States, DeGraff, Ohio - supplied by Derby Packaging,
Sidney, Ohio.

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5. Two Spacers Part #617888:
200 lb. singlewall C Flute - Blank Size: 14 x 6.75". Grade 33-26-33 per drawing B17888. Manufactured by Akers Packaging, Middletown, Ohio - supplied by Derby Packaging, Sidney, Ohio.
6. Two (2) Corner Protectors Part #61607322:
200 lb. doublewall B/C Flute - Blank Size: 43.75 x 9.75". Grade 33-26-26-26-33 - Glue HL-7262X - Separable for recycling. Two honeycomb pieces 3 x 22.25 x 1.125" per drawing B16073. Manufactured by Akers Packaging, Middletown, Ohio and Mid States, DeGraff, Ohio - supplied by Derby Packaging, Sidney, Ohio.

TESTING ANALYSIS AND RESULTS

Upon completion of testing, each test specimen was reviewed for damage and leakage. Pack met required vibration, cobb, drop tests, and stacking tests. Above UN Pack is considered meeting required UN Testing Criteria for Group III.

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