

ORNL Carbon Steel Salvage Open Head 85-Gallon Drum Specification

Press  to see Check List only.

Description	Stores Catalog Number	Packaging Filling Instructions	Plant
Drum, Carbon steel, open head, 85 gallon, Salvage Drum, UN 1A2/X 400/S , 1.5189 mm Nominal (16 gauge), 26 in. ID	02-112-6430	ORNL-CHK-28	ORNL (also at Y-12)

**Mfg. Details Per: ORNL Packaging Specifications
No. 104-1A2-0006
Issue Date: April 15, 1994
Revised Date: December 27, 2002**

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Oak Ridge National Laboratory (ORNL)

Packaging Specifications

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REVISION LOG *

(as of November 1, 2002)

DATE	REVISION NUMBER	REVISION (S) MADE
11/21/2002	-0006	¶2.8 Added "See Attachment #1 ..."; QC Checklist added closing instruction requirement (made item #4 and re-numbered remaining items); ¶7.0 removed "Cullman, Alabama" from Greif Brothers location; ¶9.0 reworded so closing instructions are included in each shipment.; Appendix A-1 reworded first NOTE to "...DOE Headmark List..."; Added Attachment #1 , DOE Headmark List.

*Revision Log was initiated November 1, 2002 for ease in identifying revision mad to the specification.

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1.0 GENERAL DESCRIPTION

Open Head (OH) Carbon Steel Salvage drum with welded seams, 3 rolling hoops, steel body, steel head, conventional (with seams) construction. Steel gauge and specific variations as specified in [Appendix A-1](#) for 85 and 110 gallon drum capacity.

1.1 United Nations Designation - UN 1A2 /X **/ S/ * [per 49 CFR, ¶178.503]

Note: Salvage drums acceptable for liquids, as well as solid material, although not dual marked.

- 1A2 = Open head steel drum.
- X = Suitable for Packing Group I, II, and III materials.
- Y = Suitable for Packing Group II and III materials.
- ** = Maximum allowable gross weight in kilograms for which the drum was tested .
- S = Designation indicates packaging is for solid materials [*or combination packaging*].
- * = The last two (2) digits of the calendar year in which the container was manufactured.

Specific UN Markings are specified in the Catalog Description for the referenced catalog number for each specific drum, which are the ORNL "minimum" UN requirements.

1.2 Size:

Inside diameter (in inches) [as specified in the Catalog Description for the referenced catalog number].

2.0 MATERIAL DETAILS

Drum construction must comply with Title 49, Code of Federal Regulations (49 CFR), ¶178.504 (latest edition) for steel drums, and the following minimum requirements. Manufacturer shall document appropriate quality control on incoming raw material. No significant changes to the manufacturing process or raw material is allowed without prior approval of the Company. Steel thickness dimensions/tolerances in conformance with TABLE, per [Appendix A-1](#).

2.1 Drum Body:

Cold rolled steel, ASTM A 366 or equivalent. Top of body rolled to form 1/2 inch false wire; see [Appendix A-1](#) for steel size for stated drum capacity.

2.2 Drum Head:

Cold rolled steel, ASTM A 366 or equivalent; see [Appendix A-1](#) for steel size.

2.3 Drum Bottom:

Cold rolled steel, ASTM A 366 or equivalent; same steel size as drum body.

2.4 Body Seams:

Welded (on-line, continuous welder)

2.5 Chimes:

Mechanically seamed; bottom chime triple seamed or double seamed, if double seam, drum meets the UN test criteria, as specified.

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2.6 Gasket:

Closed-cell rubber, glued into lid--gasket material and size as necessary to meet UN performance tests. Gasket to have an operating range of - 40° F to + 158° F.

2.7 Rolling Hoops:

Three (3) each separate rolling hoops formed into the drum body, with one not more than three (3) inches from top drum curl. Rolling hoops to be in accordance with ANSI MH2-1997 Standards.

2.8 Closure:

Twelve (12) gauge bolt type locking ring, welded lugs, one lug threaded, with steel bolt. Locking ring painted, coated, or galvanized to prevent corrosion. See [Appendix A-1](#) for minimum required bolt sizes. See [Attachment #1, DOE Headmark List](#), for counterfeit bolts.

Manufacturer/supplier must furnish ORNL, in writing, closure requirements, as performed for the UN design test; per 49 CFR ¶178.2(c)(1). It must be identified on the closure instructions specifically as to the ORNL drum to which the instructions apply. Ref: [¶9.0](#) for distribution.

2.9 Surface Preparation:

Surfaces shall be prepared to retard rust formation, or be sufficiently cleaned for application of interior and exterior coatings.

2.10 Interior Finish:

85 gallon: Lined with Morton Series 46; 2/3 Epoxy, 1/3 Phenolic coating, 1 mil.
[or an equivalent material, after approval by ORNL Packaging Operations]

110 gallon: Lined with a clear phenolic coating, 1/10 mil, or equal, for rust prevention.

2.11 Exterior Finish:

Body painted with SSCI (Steel Shipping Container Institute) White, and White Head; 0.8 - 1.0 mil.

2.12 Seaming Compound:

Bottom chime must be sealed with a seaming compound, and applied in conformance to standard manufacturing quality procedures, to ensure no leakage/seepage.

2.13 Cleanliness:

Finished drums must be free of rust, dirt, oil, solvents, metal shavings, foreign contaminants, and interior moisture.

3.0 CONTAINER PERFORMANCE CRITERIA

Manufacturer shall successfully test and certify that containers meet or exceed the requirements of 49 CFR, ¶178.600 - 178.608, for the Packing Group I level.

3.1 Performance Test Documentation:

Upon request, the manufacturer must be capable of providing copies of the performance test documentation for purchased packagings, as required by 49 CFR, ¶178.601(l) for the UN certification marked packaging. Periodic audit copies will be requested randomly on purchased UN packagings. Ref: [¶9.0](#).

3.2 Performance Tests:

The specified drums require the **US Department of Transportation** UN performance criteria for design qualification testing, periodic retesting, and production tests established in 49 CFR, ¶178.600 - 178.608.

NOTE TO SELLER: The UN test/marketing certifications must be made by the drum manufacturer or a Department of Transportation approved third party tester.

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4.0 QUALITY ASSURANCE

The Seller shall assure, and be responsible, that the quality of the drums furnished under this document are of good quality, as pursuant to industry standard manufacturing practices for steel drums, including the materials/components used in the manufacturing of the stated steel drums.

The Seller shall meet the requirements stipulated in this document, and the specific requirements of the Catalog Description for the specific drum as specified in the Purchase Order.

4.1 Manufacturer's Certification:

By the act of placing the UN performance criteria markings on each drum purchased, the manufacturer acknowledges he has certified, and accepted responsibility, that the stated drum design meets or exceeds the U.S. Department of Transportation's UN performance requirements as stipulated in [§3.2](#) of this document and in accordance with the markings prescribed in 49 CFR, ¶178.503.

In addition, this certification marking acknowledges that the drum manufacturer has complied with the specific standards for steel drums specifically listed in 49 CFR ¶178.504.

4.2 Receiver Inspections:

The following inspections will be performed on the incoming drums by receiver to determine the drums meet quality standards and the requirements of this document. However, the receiver is not limited to the following inspections to determine quality and specification conformance. Conformance will be indicated by a Y or N in the "Y/N" column, and negative responses documented on the Nonconformance Report (NCR), *ORNL-311*, (per ORNL Nonconformance Report Instructions), attached to the checklist, and submitted to ORNL's Packaging Operations (PkgOps) for necessary action.

NOTE: Checklist for this specification is on the following page.

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This checklist is to be reproduced for QC Inspections.

Receiver Inspection Quality Control (QC) Checklist for Incoming Steel Drums

QC Conformance		Y/N	<< "No's" to be documented on form ORNL-311, with checklist
1	Capacity		Drum is the capacity specified in the Order/Catalog Description.
2	Drum Surface		Clean, no significant scratching, dings or dents in drum, no significant corrosion, on exterior and interior surface of drum.
3	Locking rings, chimes		Bolted locking rings are painted steel, contain bolt size specified in Appendix A-1 , and shows no significant rusting /corrosion.
			Bolted locking rings close tightly, not loose around drum lid.
4	Closing Instructions		Closing Instructions are included with each shipment per §2.8 .
			Drums are able to be closed according to closing instructions.
5	Drum lids		Lids are painted WHITE, show no significant rusting/corrosion or dents.
6	Lid Gaskets		Gaskets securely glued into the drum lids.
7	Drum interior		Visually verify lined, including lids; Ref. §2.10 of this specification.
8	Drum exterior		Painted White [SSCI (Steel Shipping Container Institute) standard].
9	Markings		Drums marked (as a minimum) with ORNL specified UN markings, per Catalog Description.
			Drums legibly marked (embossed) on drum bottom in accordance with required 49 CFR markings, and specified gross test weight.
			Markings include the manufacturer's identification -- company name or registered symbol (initials or M-number), or test agency code; after USA/. Ref: 49 CFR, §178.503(a)(8) .
10	Side Markings		The required UN markings are durably and legibly marked.

Catalog Number _____

P. O. Number _____

Total Units Received _____

Inspection Method: Per ORNL PkgOps QC Inspection Plan

Sample Size _____ [Based on ANSI/ASQC Z1.4-1993]

NCR No. _____

Inspector/Date _____

Additional comments on back: _____ check, if yes.

The above QC inspection check list shall be accomplished for each order based on random samples of incoming carbon steel drums, by QC personnel to determine manufacturer's conformance to the specified ORNL Packaging Specifications.

Shipments of carbon steel drums not meeting specified requirements will be returned to the seller for credit.

QC inspections resulting in noncompliance with these Packaging Specifications will be cause for rejection of the entire shipment.

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5.0 MARKING

As a minimum, each drum shall be marked in accordance with 49 CFR, §§178.2, 178.3, and 178.503 in a conspicuous location on exterior surface of the drum. Markings shall have a minimum letter height of 1/2 inch. Markings must include the manufacturer's identification -- company name or registered symbol (initials or M-number), or test agency code, per 49 CFR, §178.503(a)(8).

Additionally, drums are to be marked with the UN markings as stipulated in [§1.1](#) of this specification, and specifically stated in the Catalog Description.

The letters: CATN--(dash) plus the last four (4) digits of the catalog number must be marked below the UN markings:

110 gallon = CATN--6100

85 gallon = CATN--6430

6.0 INTENDED USE

Containers are intended for Packing Group I, II, and III hazardous materials in solid or liquid form. Maximum fill capacity of the drum shall not exceed the tested gross weight or density marked on the drum.

7.0 SUGGESTED MANUFACTURERS

The following list of suggested manufacturers have demonstrated ability to comply to the requirements set forth in this document. However, this list does not guarantee current or continued availability as a suggested manufacturer source:

- Skolnik Industries, Inc, Chicago, Illinois
- Greif Bros. Corp.
- All-Pak, Inc., Columbus, Ohio
- Packaging for Industry, Knoxville, Tennessee
- Packaging Specialties, Cleveland, Ohio

The Seller must advise the Company prior to any change in the current source (manufacturer) of packaging materials described in this Packaging Specification.

Any Manufacturer that satisfactorily demonstrates to the Company the capability to furnish packaging in compliance with this Packaging Specification, may be added to the above listing.

8.0 AUTHORIZED CHANGES

Changes/revisions in the requirements specified in this document will only be authorized by ORNL PkgOps as coordinated with Oak Ridge facilities packaging operations.

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9.0 DISTRIBUTION OF UN PERFORMANCE TEST REPORTS (per [§13.1](#)) and CLOSURE INSTRUCTIONS (per [§12.8](#))

- A) Closure instructions must be furnished with each order for each type/size package purchased by ORNL, directly to the Packaging Operations Manager at the address, or fax number, below.
- B) Upon specific request, UN performance test documentation for each specified order/shipment will be submitted directly to the Packaging Operations Manager at the address, or fax number, below.

**Oak Ridge National Laboratory
Packaging Operations Manager
Bldg. 7001, MS 6288
P.O. Box 2008, 1 Bethel Valley Road
Oak Ridge, Tennessee 37831-6288
(865) 574-7098 [fax]**

**SPECIFIC REQUIREMENTS for
ORNL UN PACKAGING SPECIFICATIONS**

APPENDIX A-1

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Re-issued: November 5, 2002

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CARBON STEEL DRUM CONSTRUCTION VARIATIONS

OPEN HEAD (OH) DRUMS [Fully Removable Heads]								TIGHT HEAD DRUMS		
ORNL No. 104-1A2-0005			ORNL No. 100-1A2-0005					ORNL No. 101-1A1-0003		
Construction	110 gallon	85 gallon	55 gallon	30 gallon	15/16 gallon	10 gallon	5 gallon	55 gallon	30 gallon	16 gallon
Nominal, mm	1.5189	1.5189	1.5189	1.2141	0.9119	0.9119	0.7595	1.2141	1.2141	0.9119
** Steel Thickness	.0598 in.	.0598 in.	.0598 in.	.0478 in.	.0359 in.	.0359 in.	.0299 in.	.0478 in.	.0478 in.	.0359 in.
Minimum, mm	1.3538	1.3538	1.3538	1.0871	0.8230	0.8230	0.6833	1.0871	1.0871	0.8230
	.0533 in.	.0533 in.	.0533 in.	.0428 in.	.0324 in.	.0324 in.	.0269 in.	.0428 in.	.0428 in.	.0324 in.
<i>Drum gauge</i>	<i>16 ga.</i>	<i>16 ga.</i>	<i>16 ga.</i>	<i>18 ga.</i>	<i>20 ga.</i>	<i>20 ga.</i>	<i>22 ga.</i>	<i>18 ga.</i>	<i>18 ga.</i>	<i>20 ga.</i>
Head Thickness Same Tolerances ■	1.5189 <i>16 ga.</i>	1.5189 <i>16 ga.</i>	1.5189 <i>16 ga.</i>	1.2141 <i>18 ga.</i>	0.9119 <i>20 ga.</i>	0.9119 <i>20 ga.</i>	0.7595 <i>22 ga.</i>	1.2141 <i>18 ga.</i>	1.2141 <i>18 ga.</i>	0.9119 <i>20 ga.</i>
Rolling Hoops	3 each	3 each	3 each	2 each	2 each	2 each	2 beads	2 each	2 each	2 each
Locking Ring –mm Nominal ■	2.6568 <i>12 ga.</i>	2.6568 <i>12 ga.</i>	2.6568 <i>12 ga.</i>	2.6568 <i>12 ga.</i>	1.5189 <i>16 ga.</i>	1.5189 <i>16 ga.</i>	0.9119 <i>20 ga.</i>	----	----	----
Bolt Size *see note below	5/8 inch	5/8 inch	5/8 inch	5/8 inch	3/8 inch	5/16 inch	5/16 inch	----	----	----
Gaskets (glued in lid)	Required	----	----	----						
Bung Openings	No	2 & ¾ inch	2 & ¾ inch	2 inch						
Interior Lining [Ref: ¶2.10]	Clear Phenolic	Epoxy/ Phenolic	Epoxy/ Phenolic	Epoxy/ Phenolic	Clear Phenolic	Clear Phenolic	Clear Phenolic	Clear Phenolic	Clear Phenolic	Clear Phenolic

* NOTE: Counterfeit bolts, as stipulated on current DOE Headmark List (see [Attachment #1](#)), will not be accepted. Bolts are of foreign origin.

**NOTE: Steel thickness dimensions/minimum tolerances, in millimeters, are converted from the DOT Gauge Table, CFR 49, ¶173.24, pre-HM-181 docket. [inches x 25.4000 = millimeters; current CFR 49, ¶171.10(c)(2)]

■ NOTE: Minimum gauge thickness tolerances, as shown above, apply (block 1).

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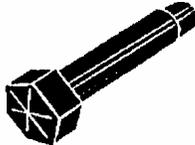
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ATTACHMENT #1

DOE Headmark List

ANY BOLT ON THIS LIST SHOULD BE TREATED AS DEFECTIVE WITHOUT FURTHER TESTING.



ALL GRADE 5 AND GRADE 8 FASTENERS OF FOREIGN ORIGIN WHICH DO NOT BEAR ANY MANUFACTURERS' HEADMARKS:



GRADE 5



GRADE 8

GRADE 5 FASTENERS WITH THE FOLLOWING MANUFACTURERS' HEADMARKS:

<u>MARK</u>	<u>MANUFACTURER</u>	<u>MARK</u>	<u>MANUFACTURER</u>
	J Jinn Her (TW)		KS Kosaka Kogyo (JP)

GRADE 8 FASTENERS WITH THE FOLLOWING MANUFACTURERS' HEADMARKS:

<u>MARK</u>	<u>MANUFACTURER</u>	<u>MARK</u>	<u>MANUFACTURER</u>
	A Asahi Mfg (JP)		KS Kosaka Kogyo (JP)
	NF Nippon Fasteners (JP)		RT Takai Ltd (JP)
	H Hinomoto Metal (JP)		FM Fastener Co of Japan (JP)
	M Minamida Sleybo (JP)		KY Kyoel Mfg (JP)
	MS Minato Kogyo (JP)		J Jinn Her (TW)
	Hollow Triangle Infasca (CA TW JP YU) (Greater than 1/2 inch dia.)		
	E Dalal (JP)		UNV Unytite (JP)

GRADE 8.2 FASTENERS WITH THE FOLLOWING HEADMARKS:

<u>MARK</u>	<u>MANUFACTURER</u>
	KS Kosaka Kogyo (JP)

GRADE A325 FASTENERS (BENNETT DENVER TARGET ONLY) WITH THE FOLLOWING HEADMARKS:

	<u>MARK</u>	<u>MANUFACTURER</u>
Type 1		A325 KS Kosaka Kogyo (JP)
Type 2		
Type 3		

Key: CA-Canada, JP-Japan, TW-Taiwan, YU-Yugoslavia