ORNL Carbon Steel Open Head,
Lever Lock Closure
55-Gallon Drum Specification

Press QC Check List **to see Check List only.**

Description	Stores Catalog Number	Packaging Filling Instructions
Drum, Carbon steel, open head, 55 gallon, lever lock closure drum, UN 1A2/X 440/S *and* UN 1A2/Y 1.4/200, 1.5189 mm Nominal (16 gauge), 22.5 in. ID	**02-112-6555**	**ORNL-CHK-48** (for HazMat use) *or* **ORNL-PKG-52** (for Type A use)

Mfg. Details Per: ORNL Packaging Specifications
No. 107-1A2-0000
Issue Date: March 1, 2004
Revised Date:

REVISION LOG *

DATE	REVISION NUMBER	REVISION (S) MADE
03/01/2004	-0000	Specification issued.

*** Revision Log** is for ease in identifying revisions made to the specification.

1.0 GENERAL DESCRIPTION

Open Head (OH) Carbon Steel drum with welded seams, *2 or 3* rolling hoops, steel body, steel head, conventional (with seams) construction. Steel gauge and specific variations as specified in Attachment #1 for *55, 30, 5* gallon drum capacity.

1.1 United Nations Designation - UN 1A2 /X **/ S/ * [UN 1A2 /Y sg/ tp/ *]^{dm} [per 49 CFR, ¶178.503]

dm = Drum dual marked for liquids, as well as solid material.
1A2 = Open head steel drum.
X = Suitable for Packing Group I, II, and III materials; Y = PG II and III only.
**** = 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.**
sg = Specific Gravity of material for which drum design type was tested.
tp = Hydrostatic test pressure (in kilopascals) for which drum design type was tested. [100 kPa = 14.7 psig; 250 kPa = 36.3 psig]

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. These drums are required to pass Type A testing for solids.

1.2 Size:

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

Drum dimensions to be in accordance with ANSI MH2-1997 Standards (American National Standards Institute) for Steel Drums and Pails *[does not apply to 15 and 5 gallon drums]*.

2.0 MATERIAL DETAILS

Drum construction must comply with Title 49, Code of Federal Regulations (49 CFR), ¶178.504 and ¶178.350(a) (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 Attachment #1. Price-Anderson Amendments Act (P-AAA) quality requirements apply.

2.1 Drum Body:

Cold rolled steel, ASTM A 366 or equivalent. Top of body rolled to form 2 inch false wire--see Attachment #1 for steel size for stated drum capacity.

2.2 Drum Head:

Cold rolled steel, ASTM A 366 or equivalent; see Attachment #1 for steel size.

2.3 Drum Bottom:

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

2.4 Body Seams:

Welded (on-line, continuous welder).

2.5 Chimes:
Mechanically seamed; bottom chime triple seamed, *or* either double-seamed or double-seamed *and* welded, if the double seam drum meets UN test criteria as specified.

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. Must be EPDM or approved equivalent.

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 for 55-gallon capacity drums. Two (2) each rolling hoops for 30-gallon and 10-gallon capacity drums. Rolling hoops to be in accordance with ANSI MH2-1997 Standards.

2.8 Closure:
Closure is lever lock style closure. Locking ring painted, coated, or galvanized to prevent corrosion. The rings for the 5- and 10-gallon drums have 16 gauge steel. The rings for the 30- and 55-gallon drums have 13 gauge steel.

Manufacturer/ supplier must furnish ORNL, in writing, closure requirements, as performed for the UN and Type A 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:
55- and 30-gal: Lined with an epoxy/phenolic coating, 1 mil. [*or an equivalent material, after approval by ORNL Packaging Operations*]
5- and 10-gal: Lined with an epoxy/phenolic coating, 1/10 mil, or equal, for rust prevention.

2.11 Exterior Finish:
Body painted SSCI (Steel Shipping Container Institute) Black, with White head (*unless specified differently elsewhere*).

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. Seaming compound is omitted for double seam/welded bottom chimes.

2.13 Cleanliness:
Finished drums must be free of rust, dirt, oil, solvents, metal shavings, foreign contaminates, 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; Packing Group I level for solids, Packing Group II level for liquids.

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. The manufacturer must supply documentation to fulfill the requirements specified in 49 CFR, ¶173.415(a). The manufacturer shall maintain test documentation per 49 CFR, ¶173.415(a). Periodic audit copies for UN testing will be requested randomly on purchased UN packagings. Type A documentation with traceability to a specific order is required for each order. Ref: ¶9.0.

3.2 Performance Tests:

The specified drums require the **U.S. Department of Transportation** UN performance criteria for design qualification testing, periodic retesting, and production tests established in 49 CFR, ¶178.600 - 178.608. Type A compliance must be in accordance with 49 CFR, ¶173.461.

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

4.0 QUALITY ASSURANCE

The Seller shall have in place a recognized quality program (i.e., NQA-1) which will satisfy the P-AAA requirements and ensure that 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.

A Certificate of Compliance (CoC) for Type A criteria will be required specifying Work Order Number and/or container serial number traceable to each order.

NOTE: Throughout this specification, this will be referenced as Manufacturer's Identifying Number.

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*, (items 3-16), attached to the checklist and submitted to ORNL's Packaging Operations (PkgOps) for necessary action.

NOTE: Checklist for this specification is on following page.

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	Steel gauge size		Meets dimensions/tolerances per attached CONSTRUCTION VARIATIONS TABLE, Attachment #1.
2	Capacity		Drum is the capacity specified in the Order/Catalog Description.
3	Drum Surface		Clean, no significant scratching, dings or dents in drum; no significant corrosion, on exterior and interior surface of drum.
4	Locking rings		Lever lock rings are painted, coated or galvanized steel and show no significant rusting /corrosion.
			Lever locking rings close tightly; not loose around drum lid.
5	Rolling Hoops		Drums have correct number (i.e., two each for 10- and 30-gallon drum; three each for 55-gallon drum) of chimes/rolling hoops per ¶2.7
6	Closing Instructions		Closing Instructions are included with each shipment per ¶2.8.
			Drums are able to be closed according to closing instructions.
7	Drum lids		Lids are painted WHITE; no significant rusting/corrosion or dents.
8	Gaskets in lids		Gaskets are securely glued into the drum lids.
9	Drum interior		Visually verify lined, including lids; Ref. ¶2.10 of this specification.
10	Drum exterior		Painted Black (SSCI {Steel Shipping Container Institute} standard), except lids, unless another color is specified elsewhere in the specific order.
11	Markings		Drums marked (as a minimum) with ORNL specified UN markings, per Catalog Description -- which include **BOTH** solid and liquid (dual) UN markings.
			Drums legibly marked (embossed) on drum bottom in accordance with required 49 CFR markings, and specified gross test weight. Permanent (embossed) markings are not required on bottoms of *5* and *10* gallon drums—required durable complete markings must be on bottom or side per 49 CFR, ¶178.503(a).
			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).
			Markings include the last four (4) digits of the Catalog Number (i.e., 6555)
			Markings include manufacturer's Work Order Number per ¶5.0.
12	Side Markings		The required UN markings (including the specified dual UN marks) are durably and legibly marked on side.
13	Documentation		Type A CoC with manufacturer's identifying number has been included per ¶3.1.

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 these specified 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 Packaging Specifications is cause for rejection of the entire shipment.

5.0 MARKING

As a minimum, each drum shall be marked in accordance with 49 CFR, ¶178.3, 178.502 and 178.503 in a conspicuous location on exterior surface of the drum. Duplicate markings must be on drum sides, just below top drum curl, to be in compliance with ¶178.3(a)(5). Markings shall have a minimum letter height of 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).

All markings shall be indelible.

Open Head Drums are to be UN dual marked (embossed) for both liquids and solid materials.

The manufacturer's identifying number(s) will be marked on the drum.

Additionally, drums are to be marked with the UN markings, including the specified dual 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) numbers of the catalog number must be marked below the UN markings:

55 gal = CATN--6555
30 gal = CATN--6530
10 gal = CATN--6510
5 gal = CATN--6505

6.0 INTENDED USE

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

Additionally, containers are intended for use as a USA DOT 7A, Type A packaging for solids.

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

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

Any Manufacturer that satisfactorily demonstrates to the Company the capability to furnish packaging in compliance with these Packaging Specifications, 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.

9.0 DISTRIBUTION OF UN PERFORMANCE TEST REPORTS (per ¶3.1), TYPE A DOCUMENTATION (per ¶3.0) and CLOSURE INSTRUCTIONS (per ¶2.8)

A) Upon each specific request, UN performance test documentation for specified order/shipment will be submitted directly to the Packaging Operations Manager at the address, or fax number, below.

B) Type A CoC with manufacturer's identifying numbers and ORNL's Purchase Order noted is to be included with each order.

C) 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.

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]

ATTACHMENT #1

CARBON STEEL OPEN HEAD DRUM CONSTRUCTION VARIATIONS

ORNL No. 107-1A2-0000 (Lever Lock Drum)				
Construction	55-gallon	30-gallon	10-gallon	5-gallon
Steel Thickness * *Nominal, mm*	1.5189 .0598 in.	1.2141 .0478 in	0.9119 .0359 in	0.9119 .0359 in
Minimum, mm	1.3538 .0533 in.	1.0871 .0428 in	0.8230 .0324 in	0.8230 .0324 in
Drum Gauge	*16 gauge*	*18 guage*	*20 gauge*	*20 gauge*
Head Thickness *Same Tolerances* ■	1.5189 *16 gauge*	1.5189 *16 guage*	1.2141 *18 gauge*	1.2141 *18 gauge*
Rolling Hoops	3 each	2 each	2 each	None
Locking Ring – mm *Nominal* ■	2.2784 *13 gauge*	2.2784 *13 gauge*	1.5189 *16 gauge*	1.5189 *16 gauge*
Gaskets *(glued in lid)*	Required	Required	Required	Required
Interior Lining *[Ref. ¶2.10]*	Epoxy/Phenolic	Epoxy/Phenolic	Epoxy/Phenolic	Epoxy/Phenolic

***** 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).