

# ORNL Carbon Steel Open Head Composite 30-Gallon Drum Specification

Press  to see Check List only.

Description	Stores Catalog Number	Packaging Filling Instructions	Plant
Drum, Carbon Steel, open head composite, 30 gallon, 18 1/4 in. ID, with polyethylene insert, <b>UN 6HA 1/Y 1.8/100</b> , 1.2141 mm Nominal (18 gauge)	02-112-5920	ORNL-CHK-31	ORNL (Also available at Y-12)

**Mfg. Details Per: ORNL Packaging Specifications**

**No. 111-6HA-0005**

**Issue Date: April 15, 1994**

**Revised Date: November 15, 1999**



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# Oak Ridge National Laboratory (ORNL)

## Packaging Specifications

### Open Head Carbon Steel Composite Drum

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## 1.0 GENERAL DESCRIPTION

Open head (OH) Carbon Steel Composite ("overpack") drum with welded seams, 2 rolling hoops, steel body, steel head, conventional (with seams) construction, bolted locking ring closure, containing a polyethylene insert, 18 gauge steel, 30 gallon capacity.

### 1.1 United Nations Designation - UN 6HA1 /Y 1.8/100/ \* [ per 49 CFR, &178.503]

- 6HA1** = Open head steel composite drum with a plastic (PE) insert (receptacle).
- Y** = Suitable for Packing Group II and III materials.
- 1.8** = Maximum specific gravity (density) for which drum design type was tested .
- 100** = Hydrostatic test pressure (in kilopascals) for which drum design type was tested.  
[ 100 kPa equivalent to 14.7 pounds per square in (psig) pressure - for PG II test.]
- \*** = The last 2 digits of the calendar year in which the container was manufactured.

Specific UN Markings are specified above and 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 - 18<sup>1</sup>/<sub>4</sub> inches

Drum dimensions to be in accordance with ANSI MH2-1997 (American National Standards Institute) Standards for Steel Drums and Pails.

## 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.

### 2.1 Drum Body:

1.2141 mm Nominal cold rolled steel, 1.0871 mm Minimum (18 Gauge). Reference [Appendix B](#).

### 2.2 Drum Head:

Cold rolled steel, as specified above for drum body.

### 2.3 Drum Bottom:

Cold rolled steel, as specified above for drum body.

### 2.4 Body Seams:

Welded (on-line, continuous welder).

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## 2.5 Chimes:

Mechanically seamed; bottom chime triple seamed *or* double seamed, if double seam drum meets the 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.

## 2.7 Rolling Hoops:

Two (2) each separate rolling hoops formed into the drum body. Rolling hoops to be in accordance with ANSI MH2-1997 Standards.

## 2.8 Closure:

Steel cover (head) with polyethylene insert bung closures of 2 inch and  $\frac{3}{4}$  inch. NPT threads. Head secured with a 12 gauge bolt type locking ring with welded lugs. Locking ring painted, coated, or galvanized to prevent corrosion.

*Manufacturer/supplier* must furnish ORNL, in writing, closure requirements, as performed the for 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.

## 2.10 Interior:

Polyethylene insert container; minimum 30 mil for 30 gal capacity.

## 2.11 Exterior finish:

Body painted SSCI (Steel Shipping Container Institute) Black, with White head.

## 2.12 Seaming Compound:

Chimes 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 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, for the Packing Group II 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(1) 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/markings 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 also 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), UCN 11457, (items 3-21b), attached to the checklist, and submitted to ORNL's Packaging Operations (PkgOps) for necessary action.

*NOTE: Checklist for this specification on following page.*

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*This checklist will be reproduced for QC Inspections.*

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

QC Conformance	Y/N	<<"No's" to be documented on form UCN-11457, 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 of drum surface.
3	Bung Closures	Cover with two (2) bung closures: 2 inch and ¾ inch polyethylene, NPT threads.
		Bung openings/closures are in good condition; no defects noted.
4	Drum lids	Lids painted WHITE; show no significant rusting/corrosion or dents.
5	Drum exterior	Painted BLACK (SSCI standard)
6	Markings	Drums marked (as a minimum) with ORNL specified UN markings, per Catalog Description.
		Drums legibly marked (embossed) in accordance with required 49 CFR markings, and specified density and test pressure.
		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).
7	Side Markings	The required UN markings are durably and legibly on the side.
8	Bolted locking ring closure	Drum head securely and tightly affixed with locking ring.
		Locking ring painted to prevent rusting.

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 provided 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 non-compliance 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 ½ 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 specified 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) numbers of the catalog number must be marked below the UN markings:

**30 gallon = CATN--5920**

## 6.0 INTENDED USE

Containers are intended for Packing Group II and III hazardous materials in liquid form. Maximum fill capacity of the drum shall not exceed the tested hydrostatic pressure 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:

- All-Pak, Inc., Columbus, 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 &3.1) and CLOSURE INSTRUCTIONS (per &2.8)

A) Closure instructions must be furnished for each initial order, and annually (at the minimum) for each type/size package purchased by ORNL, directly to the Packaging Operations Manager at the address 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 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**

# Oak Ridge National Laboratory (ORNL)

## Steel Gauge Tolerances For Steel Drum QC Evaluation

APPENDIX B

Issued: February 24, 1995

Revised: June 15, 1999

### STANDARD FOR QC INSPECTIONS OF GAUGE THICKNESS FOR PURCHASED STEEL DRUMS

The below table of metal gauge thickness dimensions, and tolerances is to be used when evaluating steel drums for compliance to the specified steel thickness (gauge) set forth in the ORNL Packaging Specifications for the purchase of steel drums at ORNL facilities.

This table is furnished, in that, the US DOT Hazardous Material Regulations (49 CFR) under the new UN Performance Packaging concept no longer specifies gauge thickness and tolerances for steel drums - only test criteria.

Oak Ridge National Laboratory, however, in the ORNL UN Hazardous Material Packaging Specifications, specifies specific steel thickness (gauges) for the UN steel drums to be purchased, as well as the required UN performance criteria. In addition, the past DOT gauge table is incorporated directly into the DOE "White Book" for the DOT 7A, Type A packaging.

GAUGE NUMBER	NOMINAL THICKNESS (Inches)	NOMINAL THICKNESS (Millimeters)	MINIMUM THICKNESS (Inches )	MINIMUM THICKNESS (Millimeters)
12	0.1046	2.6568	0.0946	2.4028
14	0.0747	1.8974	0.0677	1.7196
16	0.0598	1.5189	0.0533	1.3538
18	0.0478	1.2141	0.0428	1.0871
19	0.0418	1.0617	0.0378	0.9601
20	0.0359	0.9119	0.0324	0.8230
22	0.0299	0.7595	0.0269	0.6833
24	0.0239	0.6071	0.0209	0.5309
26	0.0179	0.4547	0.0159	0.4039
28	0.0149	0.3785	0.0129	0.3277

#### NOTES:

The above table of gauge values (in inches) were extracted from the past DOT specifications; 49 CFR, &173.24(a)(2) (pre-HM 181) for steel sheets; for the gauges as specified for DOT 17C, 17E, 17H, 37A, etc. steel drums.

Conversion to millimeters is: inches multiplied by 25.4000 mm/in = millimeters. [current 49 CFR, &171.10 (c)(2)]

Minimum Thickness for Reuse (reconditioning) is 1.1 millimeters (therefore, above 19 gauge steel).