

**Oak Ridge National Laboratory (ORNL)
Transportation and Packaging Management (TPM)
Container Preparation and Filling Instructions/Checklist**

UN 55 Gallon Open Head (OH) Steel Drum

ORNL-CHK-10, Rev. 7

Issued: 5/15/1997

Revised: 2/6/2006

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INSTRUCTIONS: Complete the activities requested following the instructions below. Activities should be checked off as performed. The completed checklist should then be signed by the Operating Personnel completing the checklist and submitted to the Operations Supervisor for approval for shipment.

NOTE 1: The 55 gallon open head drum is UN marked for filling with either liquid or solid hazardous materials.

NOTE 2: The maximum allowable gross weight is embossed (bottom) and marked (side) on each drum in kilograms [e.g., 320 kilograms (700 lbs)]. Allowable weight applies to Packaging Groups I, II, or III solid materials.

NOTE 3: The maximum allowable specific gravity is embossed (bottom) and marked (side) on each drum [e.g., 1.4]. Allowable specific gravity applies to Packaging Groups II and III liquid materials. [*PG I not authorized*]

NOTE 4: The maximum allowable vapor pressure is embossed (bottom) and marked (side) on the drum in kilopascals [e.g., 100 kPa (15 psig)]. Allowable vapor pressure applies to Packaging Groups II and III liquids.

NOTE 5: Drum lids used during in-house storage containing vents/pressure relief devices must be removed and replaced with the original lid, which does not contain such additions, prior to offering for shipment. *The drum needs to retain its original configuration as purchased.* Contact TPM for more information.

**A. PRE-LOADING INSTRUCTIONS FOR
UN 1A2/X - UN 1A2/Y 55 Gallon Carbon Steel Drum
Stores Catalog No. 02-112-6400**

Note: Items marked (#) are solely generator's/filler's responsibility.

**Operating
Personnel**

- _____ 1. **(#)** Inspect the drum to be filled to ensure that it is in good physical condition and that no critical dents/damages, severe corrosion, etc. exist that could cause or develop into a leak during normal storage or in transportation.
- _____ 2. **(#)** Ensure that the material being filled in the drum is compatible with (will not react, soften, or attack) the drum's internal epoxy-phenolic lining.
- _____ 3. **IF** the hazardous materials/wastes is solid, **THEN** fill the drum according to the requirements/limitations specified in [NOTE 2](#) above.

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**A. PRE-LOADING INSTRUCTIONS FOR
UN 1A2/X - UN 1A2/Y 55 Gallon Carbon Steel Drum
Stores Catalog No. 02-112-6400**

Operating
Personnel

- _____ 4. **IF** the hazardous materials/wastes is liquid, **THEN** fill the drum according to the requirements/limitations specified in [NOTE 3](#) and [NOTE 4](#) on page one.

NOTE: For liquid hazardous materials/wastes, sufficient outage *MUST BE* left in the drum such that the drum will not completely fill if the contents were to reach a temperature of 55°C (131°F) in storage or transit.

- _____ 5. Ensure that the drum lid does not contain vents/relief devices when offered for shipment. Refer to [NOTE 5](#) on page one.
- _____ 6. **(#)** Ensure that the gasket is in place, is in good condition, and is adhered to the drum lid on filled drums *prior* to placing the lid on the filled drum.

**B. CLOSING INSTRUCTIONS FOR
UN 1A2/X - UN 1A2/Y 55 Gallon Carbon Steel Drum
Stores Catalog No. 02-112-6400**

- _____ 1. For drums from *General Steel Drum* (drums marked **M4065**) see [Attachment #1](#).
- _____ 2. For drums from *Greif Bros.* (drums marked **GBC**) see [Attachment #2](#).
- _____ 3. For drums from *Skolnik Industries* (drums marked **SDCC**) see [Attachment #3](#).

NOTE: Drums *must* be closed in accordance with the specific instructions furnished, and tested, by the manufacturer for each specific type/size drum, in order to be in compliance with DOT HAZMAT regulations. [49 CFR, §178.2(c)(1)]

**C. POST-LOADING INSTRUCTIONS FOR
UN 1A2/X - UN 1A2/Y 55 Gallon Carbon Steel Drum
Stores Catalog No. 02-112-6400**

- _____ 1. **IF** generator/filler is responsible for preparing package for transport, **THEN**
Label and mark the drum in accordance with the current ORNL/Department of Transportation (DOT) requirements. For off-site shipments, contact the ORNL Transportation and Packaging Management organization for appropriate DOT marking and labeling.

IF generator/filler is *not* responsible for preparing package for transport, **THEN**

This item is not applicable and should be marked **N/A**.

FOR INTERNAL USE ONLY

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**C. POST-LOADING INSTRUCTIONS FOR
UN 1A2/X - UN 1A2/Y 55 Gallon Carbon Steel Drum
Stores Catalog No. 02-112-6400**

**Operations
Supervisor**

- _____ 2. Sign and date the checklist in the appropriate signature block verifying that the activities have been performed and the checklist completed.
- _____ 3. Submit this completed checklist to the Operations Supervisor for approval for shipment.
- _____ 4. Verify that all defined activities have been successfully completed.
- _____ 5. Sign and date the checklist in the appropriate signature block, approving the container for shipment.

APPROVED FOR SHIPMENT:

Operating Personnel:	Date:
Operations Supervisor:	Date:

Prepared by: ORNL TPM Organization

Approved by: Jeff Shelton
Jeff Shelton, Manager (576-6401)
ORNL TPM - Packaging Operations

February 6, 2006

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ATTACHMENT #2

OPEN TOP STEEL DRUM
WITH BOLTED RING CLOSURE

LME5-6400 FORM # 002H-S
DRUM CODE: U55 BR 1.4-1.4-1.4 RS

CUSTOMER Lock head Martin GBC ORDER NO. _____ DATE: 08/11/99

**GREIF BROS. CORPORATION
CLOSURE NOTIFICATION FORM**

55 gal. OH steel

Pursuant to the requirements of the Department of Transportation in CFR 49 Part 178.2(c)(1), this is your notification of the closing method used for the containers sold to you on the attached delivery ticket or bill of lading. This method of closure should be used to ensure that your containers have been closed in the same manner as when they were initially tested. If there is any question regarding proper closing methods, contact your local Greif salesperson or manufacturing facility.

To Close:

- 1) Place cover on drum;
- 2) Snap the closing ring over the cover and top lip of the drum, ~~making sure that ring juncture is 90° away from 2" opening and 180° away from side seam.~~ Also, make sure the ring's lugs point down below the ring and the bottom edge of the closing ring engages under the lip of the drum.
- 3) Insert the bolt through the lug without threads. Next, screw on the locking nut. Finally, screw the bolt into the thread lug.
- 4) While tightening the bolt, tap the entire perimeter of the ring with a mallet, starting directly across from the bolt.
- 5) Tighten the bolt until 75 foot pounds of torque is reached. The cover and ring should not spin, but the free ends of the rim should have a 1/4" space maximum.
- 6) Tighten the locking nut against the lug without threads. This prevents the bolt from backing out of the closing ring.
- 7) Drums closed in this manner have met the UN performance test requirements as specified in the container markings.

Received by Customer _____ Date _____ RF-749-A

ORIGINAL - CUSTOMER COPY YELLOW - FILE COPY

REV-JG-05/26/99

DISCLAIMERS

Tests were conducted using water for liquid containers, sand and sawdust for solid containers, or water and anti-freeze mixture for plastic drums used to contain liquids. Your product may adversely affect container materials, bung threads, or closing devices. Product compatibility with the container is a shipper's responsibility.

- These instructions for container closure are based upon the closure methods used to enable these containers to pass the United Nations test requirements as outlined by the UN marking on the package.

These closure recommendations do not take into account any hazards present in your facility, or the handling, filling, or shipping of your product. The use of sparkless tools and proper safety equipment is recommended. Consult your supervisor for your special safety precautions.

Any containers used for packing of hazardous materials should be inspected prior to filling and shipment. Containers with obvious damage or deterioration should not be filled or shipped.

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ATTACHMENT #3



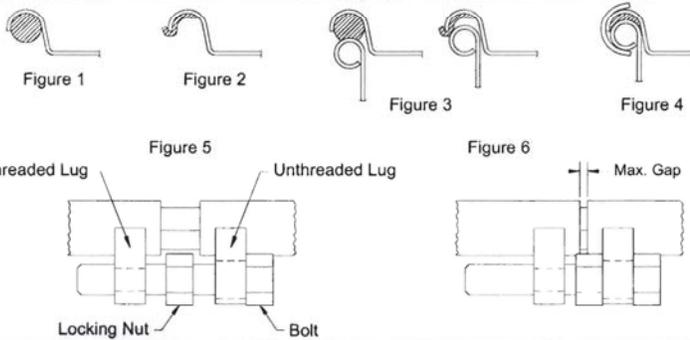
CLOSING INSTRUCTIONS

CARBON & STAINLESS STEEL DRUMS with BOLT RING CLOSURES
— READ ALL INSTRUCTIONS COMPLETELY —

OPEN HEAD DRUM - BOLT RING CLOSURE

- In compliance with **DOT 49 CFR §178.2 (c)**, persons shipping Skolnik drums must comply with the following closure instructions. Failure to do so will invalidate the UN and 7A ratings of Skolnik drums.
 - Use of components other than those supplied with the drum (or identical replacement parts from Skolnik) will also invalidate the UN rating.
- STEP 1: CHECK GASKET** – inspect cover gasket is properly fitted in cover groove (fig 1 or 2).
- STEP 2: PLACE COVER ON DRUM** – (fig 3) being careful to properly seat gasket around curl.
- STEP 3: POSITION & SEAT RING** – with lugs downward. Ensure the inner channel of the closure ring engages entire drum curl and cover (fig 4). Apply downward pressure on cover, use a rubber mallet to hammer ring to further seat ring, cover & drum curl into inner channel of ring.
- STEP 4: INSTALL BOLT** – insert bolt through unthreaded lug, screw bolt into locking nut, then into threaded lug (fig 5).
- STEP 5: CLOSE DRUM** – tighten bolt (using downward pressure on the cover and hammering outside of ring with a rubber mallet will assist closing process). Continue tightening and hammering ring until the ends of the ring reaches the maximum gap shown in the chart below.
NOTE: Ring ends should not touch and ring must be in a fixed position. The lock nut must be tightened against the un-threaded lug. (fig 6)

RING GAP REQUIREMENTS		
DRUM SIZE	U.N. MARKINGS	MAX GAP
5 – 16 gal	liquid & solid	.500" (12.70 mm)
20 – 110 gal	liquid & solid	.125" (3.175 mm)
5 – 110 gal	solids only	1.00" (25.4 mm)
55 gal composite	liquid	.850 (21.95 mm)
55 gal 7A rating	solids only	OPTION A: close to 1" gap, then torque to 25 ft-lbs OPTION B: close to .125" gap



PERFORMANCE NOTICE

Ring gap compliance is critical for the performance of Skolnik drums. Closure is assured by compressing the cover and gasket to the drum body. This is achieved when the final tightened ring gap (therefore final ring diameter) meets the specifications listed.

IMPORTANT

Please contact Skolnik Industries for further instructions if encountered with difficulties in meeting the above requirements.
Do not ship the drum.

OPEN AND CLOSED HEAD DRUMS WITH FITTINGS

- STEP 1: CHECK GASKETS** – inspect plugs for proper gasket seating
- STEP 2: INSTALL PLUG** – do not cross thread
- STEP 3: TIGHTEN** – use specification listed below:

PLUG TYPE	Tri-Sure			Rieke (plastic)	Rieke (steel)		Nuc-Fil filters
	Buna	poly or Teflon	PE/PP (composite drums)	—	poly	all other	
¾" plug	12 ft-lbs	20 ft-lbs	—	9 ft-lbs	20 ft-lbs	15 ft-lbs	8 - 12 ft-lbs
2" plug	20 ft-lbs	30 ft-lbs	10 ft-lbs	20 ft-lbs	40 ft-lbs	30 ft-lbs	—

IMPORTANT

- 1 Under the applicable DOT regulations, any changes made to the method of closure or closure components constitute a change in the design type of this packaging, and invalidate the embossed certification.
- 2 After filling and prior to transport, the shipper should check the tightness of closures to determine if the effects of heating, cooling or gasket relaxation have resulted in the need to tighten the closure.
- 3 Drums (other than the composites) are tested at room temperature.
- 4 Skolnik Industries can supply torque wrenches for plugs.

Please contact Skolnik Industries with questions regarding this information.

Revised May 5, 2005 by Skolnik Industries

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