

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

UN 5 Gallon Open Head (OH) Steel Drum

ORNL-CHK-14, Rev. 3

Issued: 5/15/1997

Revised: 12/20/2005

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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 5 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 [ex., 43 kilograms (95 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 [ex., 1.2]. Allowable specific gravity applies to Packaging Groups II and III liquid materials.

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

**NOTE 5:** The drum needs to retain its original configuration as purchased.

**NOTE 6:** 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)]

**A. PRE-LOADING INSTRUCTIONS FOR  
UN 1A2/X - UN 1A2/Y 5 Gallon Carbon Steel Drum  
Stores Catalog No. 02-112-6210**

*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 phenolic coating.
- \_\_\_\_\_ 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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**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 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 5 Gallon Carbon Steel Drum  
Stores Catalog No. 02-112-6210**

- \_\_\_\_\_ 1. For drums from *Skolnik Industries* (drums marked **SDCC**) see  
[Attachment #1](#).
- \_\_\_\_\_ 2. For drums manufactured by *Packaging Specialties, Inc.* (drums  
marked **M4492**) see [Attachment #2](#).

**C. POST-LOADING INSTRUCTIONS FOR  
UN 1A2/X - UN 1A2/Y 5 Gallon Carbon Steel Drum  
Stores Catalog No. 02-112-6210**

- \_\_\_\_\_ 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**.

- \_\_\_\_\_ 2. Sign and date the checklist in the appropriate signature block  
verifying that the activities have been performed and the checklist  
completed.

**FOR INTERNAL USE ONLY**



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## ATTACHMENT #1

### SKOLNIK

STEEL CONTAINERS • PACKAGING

## CLOSING INSTRUCTIONS

CARBON & STAINLESS STEEL DRUMS with BOLT RING CLOSURES

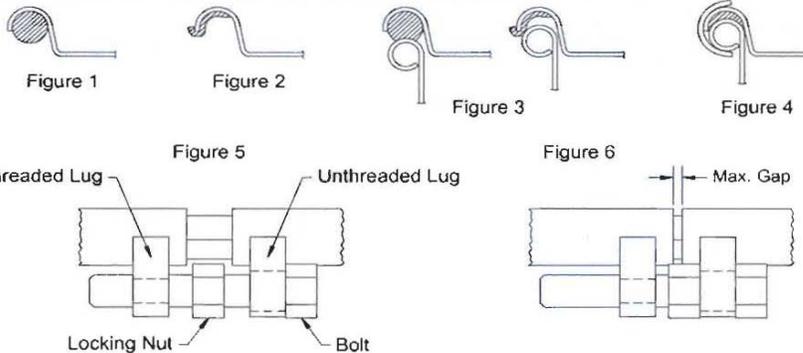
— READ ALL INSTRUCTIONS COMPLETELY —

### 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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ATTACHMENT #2



**PACKAGING  
SPECIALTIES, INC.**

Form Date: Sept. 1, 2004  
Rev.: NC  
Prepared By: P. Strauss

**ASSEMBLY INSTRUCTIONS FOR  
CLOSURE OF STEEL CONTAINERS  
USING A FORGED LUG CLOSING RING**

**PARTS LIST:**

- 1.0 Drum Body
- 2.0 Cover with Gasket
- 3.0 Closing Ring
- 4.0 Bolt
- 5.0 Jam Nut (If Supplied)

**1.0 OPEN HEAD CONTAINER**

- 1.1 Place contents into the container per applicable filling specification.
- 1.2 Place the cover on the container.
- 1.3 Place the closing ring around the cover and container curl.
  - 1.3.1 Assure the ring lugs face in a downward position.
  - 1.3.2 Place the bolt through the non-threaded lug and thread into the threaded lug.
    - 1.3.2.1 If jam nut is supplied, place nut on bolt before threading the bolt into the threaded lug.
  - 1.3.3 While tightening the bolt, tap the ring in several locations with a rubber mallet to assure the ring is set.
  - 1.3.4 Torque the bolt to a minimum of 40 ft. lbs.
  - 1.3.5 Visually inspect to assure there was no movement of the gasket which would produce a poor seal.
- 1.4 If any components are missing or damaged, or if further instruction is desired, notify the supplier for proper replacement or instruction.
- 1.5 Any substitution or deviation from this procedure will negate the certification.

PMWI005