

# Berenfield Containers

## DOT 178 Notice

### Closure Requirements for Steel Drums

*In Regulation 49 CFR 178.2(c), the Department of Transportation (DOT) requires drum manufacturers to inform their customers of how to close drum fittings and closure rings in order to ensure the drum will perform to the marking level indicated thereon. Please see that this information is available to those responsible for closing the drums after filling. The use of non-sparking tools is recommended to close drums containing hazardous materials.*

### Routing Instructions

This document must be passed along with the container within your facility, or to whom the packaging is transferred, and ultimately to the personnel responsible for closing and shipping the container. It must be used as a training document to complete closure of your container.

### DRUM PLUGS

Tighten all plugs to the recommended torque, while taking care that the plugs are not cross threaded into the flange and that the plug gaskets do not become looped or twisted while tightening. If drums are not intended for immediate shipment after filling and torquing of plugs, plug torque should be rechecked prior to shipment, and plugs retorqued as necessary.

### HEXAGONAL HEAD PLUGS / RECOMMENDED TORQUE *(Rieke Vise Grip & Vise Grip II style)*



#### STEEL PLUGS

2" or 1 1/2"		3/4"
30 ft.-lb.	Rubber gaskets	15 ft.-lb.
40 ft.-lb.	Plastic gaskets	20 ft.-lb.

#### PLASTIC or NYLON PLUGS

2"		3/4"
20 ft.-lb.	Rubber gaskets	9 ft.-lb.
20 ft.-lb.	Plastic gaskets	9 ft.-lb.

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#### ROUND HEAD PLUGS / RECOMMENDED TORQUE



2"

3/4"

#### STEEL PLUGS

20 - 30 ft.-lb.	Rubber gaskets	9 - 15 ft.-lb.
30 ft.-lb.	Polyethylene or Teflon	15 ft.-lb.

#### NYLON OR POLYPROPYLENE PLUGS

20 ft.-lb.	Rubber gaskets	9 ft.-lb.
20 ft.-lb.	Polyethylene gaskets	9 ft.-lb.

#### “TITE SEAL” NYLON OR POLYPROPYLENE PLUGS

10 ft.-lb.	All gaskets	8-12 ft.-lbs
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#### HIGH DENSITY POLYETHYLENE PLUGS

15 ft.-lb.	Rubber gaskets	4-5 ft.-lb.
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#### CAUTION

*Per 49 CFR 172.22, it is the responsibility of the person offering a hazardous material for shipment to assure that the containers selected are appropriate to the product being shipped, and that the containers are properly assembled, as per the above Closing Instructions. The correct installation and torquing of all closures, rings, plugs, etc. should be verified by the shipper prior to releasing a package for transportation.*

*Additionally, it is the responsibility of the Shipper to determine the suitability of any Berenfield packaging for transportation of hazardous materials by Air. For shipments by Air, the shipper must refer to all applicable provisions (including the Hazardous Materials Table and 172.321) in 49 CFR, and take into account the characteristics of the material being shipped and the performance capabilities of the container sold to you.*

#### CAUTION

*The components of a drum from one drum manufacturer should not be intermingled with those of another. Components from the same manufacturer from different drum specifications likewise should not be intermingled. This ensures proper fit of the subassemblies and performance of the drum. Any alteration of the drum specification that varies the design of the package from the design that was tested by or on behalf of Berenfield Containers, or any deviation from the above, voids said certification.*

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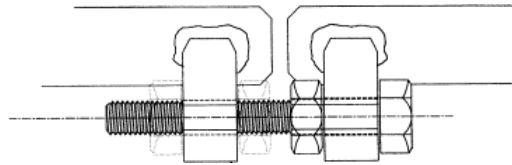
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#### CLOSING RINGS

#### BOLT LOCKING RINGS



1. Covers must be firmly seated on the top of the drum with the gasket in place. Care must be taken to ensure that the gasket has not become dislodged, looped, or twisted during either removal or placement of the cover.
2. Snap the closing ring over the cover and curl area of the drum, making sure that it is seated over the entire perimeter. **For drums with 12 gauge forged lug rings, use of a mechanical head compressing device is required to assure proper gasket compression. Ring bolts should be tightened while the cover/gasket is being compressed. Drums assembled without using a mechanical head compressing device may not perform to the certified level.**
3. While a head compressing device is preferred for all rings, for rings lighter than 12 gauge it is acceptable to tighten the ring bolt while simultaneously tapping the outside of the closing ring around the entire perimeter with a non-sparking mallet in order to compress the gasket uniformly. If a head compressing device is used, make sure that the cover is centered on the drum curl. Check to see that the cover and drum curl are pinched together and within the recess of the ring.
4. Torque the bolt and nut until the gap between the closing ring ends is  $\frac{1}{4}$ " or less but with no bending of the lugs. Aim for  $\frac{1}{8}$ " gap. For drums with poly liner "bags", the gap should be  $\frac{1}{2}$ " or less while ensuring that the liner is seated uniformly over the curl of the drum and protruding out from under the cover. Generally, the closing ring ends must not touch when the ring bolt has been fully torqued (see paragraph "b" below).
  - a. **On rings supplied with a jam nut between the lugs, tighten the nut securely against the unthreaded lug. The closing ring ends must not touch when the ring bolt has been fully torqued.**

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- b. **Rings supplied without a jam nut may look very similar to those supplied with a jam nut, however these *are not* interchangeable.** It is important that jamnuts *not be* used with rings for which they are not supplied. The closing ring ends may touch when these rings are fully torqued. See the Solid Seal ring closing instructions for specific torque values, etc. for these rings.\*\*
5. **IMPORTANT:** Open head cover gasket performance can be affected by time (age), temperature, exposure to chemicals and ozone. This could result in the loss of cover gasket elasticity. Therefore, Berenfield Containers strongly recommends verifying the closing ring bolt for correct torque prior to shipping.
  6. Recommended torque values are as follows, however, please note that the ring gap is critical, and torque values outside those listed may be required to achieve the proper gap:

<u>Berenfield Plant Supplying</u>	<u>Drum/ring configuration</u>	<u>Applied Torque</u>
Mason/Pine Bluff/Clarendon	Std. 55-gallon 12 ga. Forged Lug ring w/ 5/8" bolt	60 to 65 ft.-lbs.**
Harrisburg	Std. 55-gallon 12 ga. Forged Lug ring w/ 5/8" bolt	35 to 45 ft.-lbs.**
ALL	55-gallon, 5/16" and 3/8" bolts	not less than 15 ft.-lbs.
ALL	Intermediate drums, 12 ga. Forged Lug ring	not less than 50 ft.-lbs.
ALL	Intermediate drums, all other bolt rings	not less than 8 ft.-lbs.

**\*\*See the Solid Seal I & Solid Seal II closing instructions for specific instructions regarding Solid Seal rings**

### LEVER RINGS

1. Covers must be firmly seated on the top of the drum with the gasket in place. Care must be taken to ensure that the gasket has not become dislodged, looped, or twisted during either removal or placement of the cover.
2. Snap the closing ring over the cover and curl area of the drum, making sure that it is seated over the entire perimeter. In order to compress the gasket uniformly, tap around the entire perimeter of the ring. - FOR SOME RING/GASKET COMBINATIONS, A MECHANICAL HEAD COMPRESSING DEVICE MAY BE NECESSARY TO ACCOMPLISH THIS WHILE CLOSING THE LEVER ASSEMBLY (HANDLE).
3. For side lever locking rings, the ring latch must be snapped securely in place. For top lever locking rings, the top lever must be fully locked in place under the securing bar.

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4. Sealing the eyelets of lever rings is necessary not only for evidence tampering, but for the integrity of the closure.

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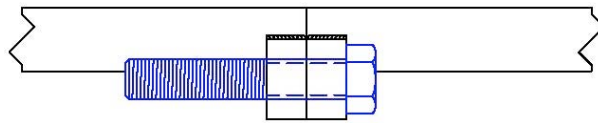
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#### **CLOSING INSTRUCTIONS FOR 1A2 FULL OPEN HEAD DRUMS WITH SOLID SEAL™ BOLT RING CLOSURE – TYPE II**

**(TYPE II HAS A 5/8" BOLT WITH A NYLON LOCKING PATCH  
WHICH ELIMINATES THE NEED FOR A RETAINING NUT OR  
JAM NUT)**



- 1.) Covers must be firmly seated on the top of the drum with the gasket in place. Care must be taken to ensure that the gasket has not become dislodged, looped, or twisted during either removal or placement of the cover.
- 2.) Snap the closing ring over the cover and curl area of the drum, making sure that it is seated over the entire perimeter. Check to see that the cover and drum curl are fully contained and centered within the recess of the ring.
- 3.) The bolts for this application have a nylon locking patch on the threads. Insert the 5/8" diameter nylon patched bolt through the unthreaded ring lug and tighten the bolt while either compressing the gasket with a mechanical head compressing device, or, if a head compressor is unavailable, simultaneously tapping the outside of the closing ring around the entire perimeter with a non-sparking mallet.
  - a.) The bolt should be tightened until the two lugs meet and touch each other with no gap. A torque of at least 30 ft-lb should be applied. If a mechanical head compressor is not used, the torque required to bring the lugs together with no gap may be higher.
  - b.) When the ring and bolt are assembled and tightened correctly the two lugs should meet and touch each other with no gap, regardless of the torque required. If the lugs do not meet, repeat steps 1 through 3.
  - c.) For drums with poly liner bags, the gap should be 3/8" or less while ensuring that the liner is seated uniformly over the curl of the drum and protruding out from under the cover.

**NOTE:** Per IFI STD 124, a nylon patch bolt may be reused (re-torqued) a maximum of five (5) times, after which it should be replaced.

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- 4.) **IMPORTANT:** Open head cover gasket performance can be affected by time (age), temperature, exposure to chemicals and ozone. This could result in the loss of cover gasket elasticity. Therefore, Berenfield Containers strongly recommends verifying the closing ring bolt for correct torque prior to shipping.

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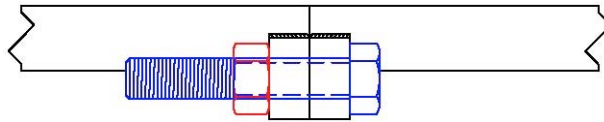
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#### **CLOSING INSTRUCTIONS FOR 1A2 FULL OPEN HEAD DRUMS WITH SOLID SEAL™ BOLT RING CLOSURE – TYPE I**

**(TYPE I IS SUPPLIED WITH A 5/8" BOLT AND RETAINING NUT)**



- 1.) Covers must be firmly seated on the top of the drum with the gasket in place. Care must be taken to ensure that the gasket has not become dislodged, looped, or twisted during either removal or placement of the cover.
- 2.) Snap the closing ring over the cover and curl area of the drum, making sure that it is seated over the entire perimeter. Check to see that the cover and drum curl are fully contained and centered within the recess of the ring.
- 3.) Insert the 5/8" diameter bolt through the unthreaded ring lug and tighten the bolt while either compressing the gasket with a mechanical head compressing device, or, if a head compressor is unavailable, simultaneously tapping the outside of the closing ring around the entire perimeter with a non-sparking mallet.
  - a.) The bolt should be tightened until the two lugs meet and touch each other with no gap. A torque of at least 30 ft-lb should be applied. If a mechanical head compressor is not used, the torque required to bring the lugs together with no gap may be higher.
  - b.) When the ring and bolt are assembled and tightened correctly the two lugs should meet and touch each other with no gap, regardless of the torque required. If the lugs do not meet, go back to step 1 and repeat steps 1 through 3.
- 4.) Following tightening of the bolt to the specified torque, thread the 5/8" diameter retaining nut onto the end of the bolt extending through the outside ring lug. The retaining nut must be tightened until its face surface comes into contact with the face surface of the threaded ring lug.

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