CLOSING INSTRUCTIONS – PLASTIC DRUMS (UN 1H1, UN 1H2W, UN 1H1W)

Mauser Packaging Solutions (MPS) provides these instructions to the filler of UN certified plastic drums. A QR code link to this document is included on the Bill of Lading for all drum shipments from MPS. You can also access the document directly at: https://mauserpackaging.com/closing-instructions/

This document applies to drums produced at the following plastic manufacturing locations:

M4232 - 1350 West Fullerton Road, Addison, IL 60101
M4235 - 410 South Trade Center Parkway, Conroe, TX 77385
M4602 - 9449 Santa Anita Avenue, Rancho Cucamonga, CA 91730
M4895 - 35 Cotters Lane, East Brunswick, NJ 08816
M5123 - 1209 Tar Heel Road, Charlotte, NC 28208
M5114 - 20A Harmich Road, South Plainfield, NJ 07080
M6586 - 1704 Barnes Street, Reidsville, NC 27320

United States Department of Transportation regulations state that packaging manufacturers are required to notify each person to whom the packaging is transferred of all requirements not met at the time of transfer. This requirement is given in Title 49, Code of Federal Regulations (49 CFR), Part 178 Specifications for Packagings, § 178.2 (c). In addition, this Paragraph requires the closing information to be provided to any person to whom this package is transferred who may need to close the packaging prior to re-shipment. Furthermore, it is the shipper's responsibility as set forth in §173.22(a)(4) to ensure that these closing instructions are carried out as described. In order to ensure the instructions are followed in a manner to result in safe transport of hazardous materials the shipper is obligated, as set forth in § 172.704(a)(4), namely - function specific training - to train his/her employees in the correct way to close the packaging for shipment. This document provides specific information on closing MPS packagings.

These closing instructions must be given to the individuals responsible for closing the packagings prior to shipment. Many companies use electronic copies as site specific work instructions and/or use laminated hard copies posted at the fill lines for reference by the fill line operators. A hard copy (printed) must be maintained by the filler or offeror for shipment.

The following tables and text give examples of the parts and closing torque required to prepare the drum for shipment so that it is capable of meeting the performance standards indicated by the UN marking on the side or top of the packaging. MPS recommends that only parts that have been tested and certified by MPS be used to close the packagings for shipment. Any UN marking is voided if parts or components other than those as sold with the original packaging design are used. Each closure is supplied with the proper gasket in accordance with the UN design type tests for the packaging supplied. In the case of removable head drums the lids, gaskets and locking rings are supplied as tested.

PRIOR TO CLOSING:

Inspect each closure to ensure that the closure has the proper gasket and that both closure and gasket are in good condition. Inspect the sealing surface for damage and make sure the threads and sealing surfaces are dry. Replace any defective gaskets, plugs or lids with new, defect free parts identical to those in the design qualification.

CLOSING PROCEDURES FOR PLUGS AND CAPS:

1. The plug or cap is inserted into the appropriate opening and screwed down “hand tight” until the gasket is in contact with the sealing surface.
2. A torque wrench capable of applying the proper torque to the fitting as specified by the closing instructions. A torque wrench is used to tighten the plug or cap until it reaches the pre-set torque as indicated by a release or click. These wrenches should be calibrated at least annually. Adjustable

wrenches available at hardware stores, auto parts stores, and through equipment catalog suppliers and drum parts suppliers.

PLASTIC NON-REMOVABLE HEAD DRUMS

All non-removable head UN 1H1, and 1H1W Plastic Drums, 49 CFR § 178.509(a)(1), 15 gallon to 65 gallon nominal capacity supplied with plug or screw cap closures with gaskets must be closed for shipment using only the closures and gaskets supplied and specified in the design qualification test for the drum as indicated below:

	Part Size/Description	Closure Torque
A	2-inch American buttress solid and vented: EPDM; Buna; FKM[3]; Silicone	20-25 ft-lbs
B	2-inch NPS/NPT solid and vented: EPDM; Buna; FKM; Silicone	20-25 ft-lbs
C	2-inch ACT[1] buttress: 81630006 with 81400023	30-40 ft-lbs
D	3/4-inch NPS/NPT solid and vented: EPDM; Silicone; FKM	6-9 ft-lbs
E	2-inch : Polyolefin and Santoprene® gaskets	25-30 ft-lbs
F	70mm x 6 Metric solid and vented: EPDM; FKM gaskets	35-40 ft-lbs
G	56 mm x 4 Metric: EPDM	20-25 ft-lbs
H	Polycon® II[2] : 2-inch EPDM	37-42 ft-lbs
I	Polycon® II : 3/4-inch NPD EPDM	8-10 ft-lbs
J	1H1W: 2-inch NPS/NPT solid and vented: EPDM	30 ft-lbs
K	1H1W: 2-inch American Buttress solid and vented: EPDM	30 ft-lbs
L	High Pressure Rings	55 ft-lbs

PLASTIC REMOVABLE HEAD DRUMS

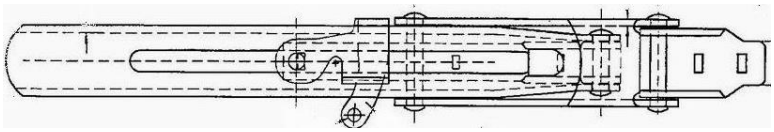
	Part Size/Description	Closure Torque
A	2-inch NPS/NPT solid and vented: EPDM; Rubber	20-25 ft lbs
B	3/4 inch NPS/NPT solid and vented: EPDM; Rubber	6-9 ft lbs
C	3/4 inch NPS/NPT solid and vented: Santoprene	3-4 ft lbs
D	DuraDrum: 2-inch NPS/NPT solid and vented: EPDM; Rubber	8-12 ft lbs
E	DuraDrum: 3/4 inch NPS/NPT solid and vented: EPDM; Rubber	3-4 ft lbs

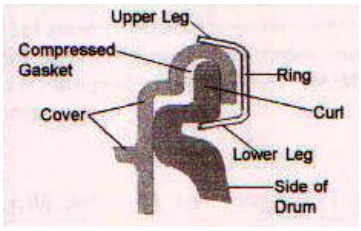
All removable head, UN 1H2, and 1H2W Plastic Drums, 49 CFR § 178.509(a)(2), of nominal capacity 8 to 60 U.S. gallons supplied with plastic lids, gaskets and associated clamp bands, or locking rings, or bolt rings, must be **closed for shipment using only the components supplied and specified** in the design qualification tests according to the following installation instructions:

- Place drum lid with gasket and selected clamp band as supplied on the top opening of the drum body.
- Firmly place lid onto top opening by applying downward pressure to lid above drum sidewall.
- While pressing down on lid, engage locking mechanism of clamp band to secure the lid in place. Make sure the locking mechanism is completely latched. Insert locking tab into slots in lever lock handle.

[1]ACT drums may also be supplied with the standard NPS and buttress fittings noted above and should be closed to those torque values
[2] Polycon II may also be supplied with the standard NPS fittings noted above and should be closed with those torque values
[3]FKM, FPM and Viton are names for the same base material: fluoro rubber.

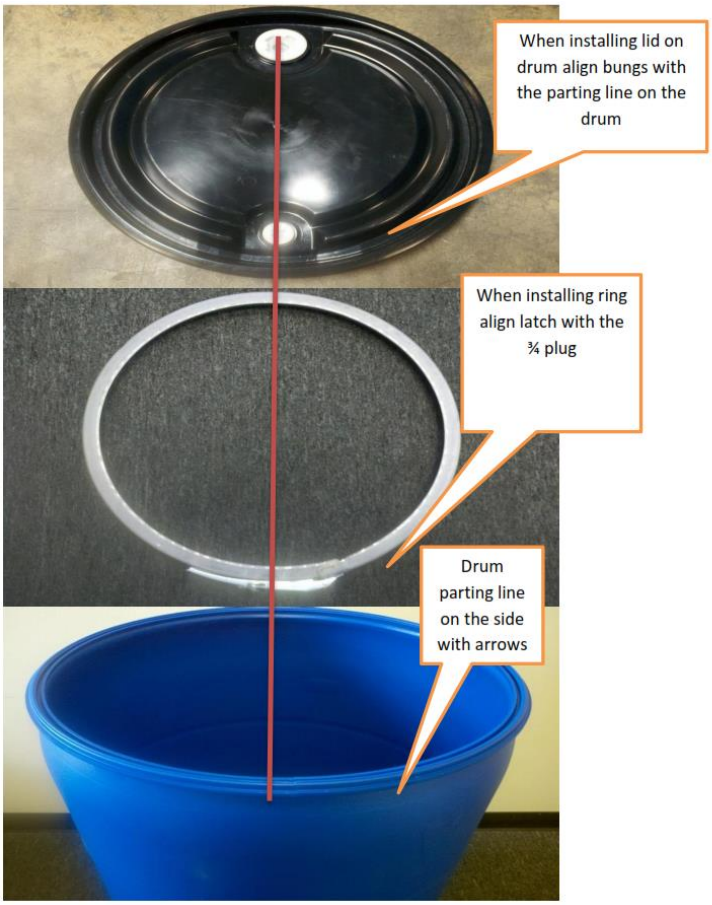
Lever Lock Side View





Please note that the Vanguard® 57 gallon HLR drum carries a liquid rating Y1.2/100 with a lever lock closure. This is valid when the lid is factory installed with a lid press. This drum should be filled through the 2-inch opening in the lid and bungs closed as in the steps listed above. If the lid is removed the liquid rating is no longer valid unless a new MPS lid is installed with a lid press and a MPS lever lock is used for closure. Following is a set of pictures instructing the user to line the parting line of the drum, the bungs and the latch in a straight line as that is the configuration under which it was tested and certified.

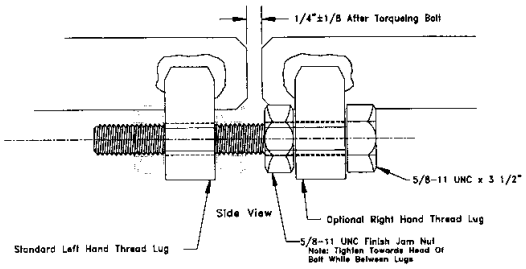
The Vanguard® HLR is not supplied with bolt ring closures.



The MPS removable head plastic drum, with the exception of the Vanguard® HLR may be provided with a bolt ring closing device. This bolt ring is closed as follows:

- Place lid with gasket in place, as supplied, on the curl at the top of the drum body.
- Place bolt ring around the drum head and curl.
- Using a head compressor, apply force to the top of the drum head assembly to compress head gasket.
- Drive bolt into ring until the ends of the bolt ring are at a 3/8-inch or less ring gap.
- If a head compressor is not available, start bolt into threaded eye, alternating tapping of ring with a mallet and drive bolt with a wrench, until bolt ring ends meet the above requirements.
- When ring has been tightened as required, the jam nut, if supplied, must be tightened against the left threaded eye.

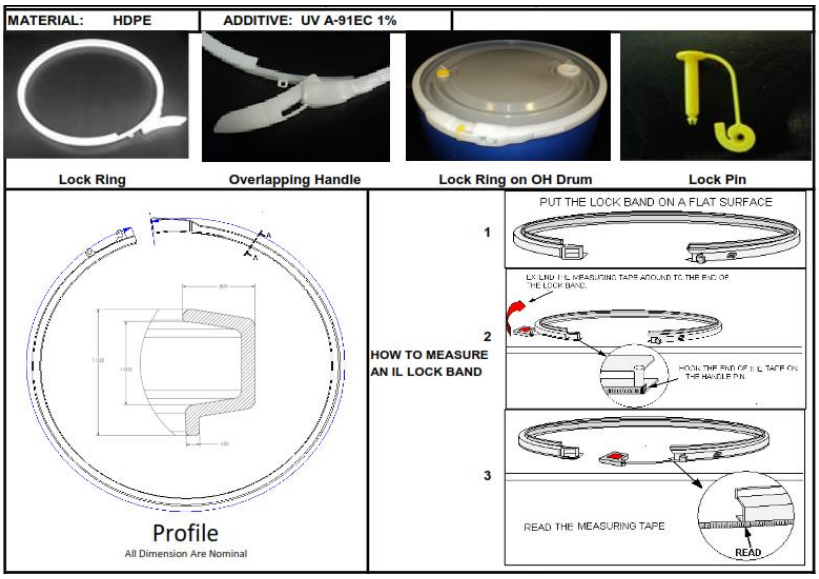
Bolt Ring Closure



Please check the controlled electronic copy to make sure that you have the latest version of this document.

The MPS removable head drum may also be fitted with a plastic lock ring assembly, part number 81560012. This plastic lock ring is closed as follows:

- Place lid with gasket in place, as supplied on the curl at the top of the drum body.
- Push firmly on lid to ensure an even seal
- Place plastic locking ring around lid making sure to cover both the lid and the underside of the top of the drum with the locking band part of the ring
- Pull the handle until the clasp mechanism closes
- Attach Tamper Evident/Locking pin in hole provided



CAP SEALS AND TAMPER EVIDENT DEVICES

Many fillers order their drums with closures “factory torqued” or with cap seals and tamper evident device factory installed. Keep in mind that the filler is responsible for closing the packaging prior to shipment and having a closure inaccessible may be viewed by regulators as a failure to properly close the packaging. It has been demonstrated repeatedly that plastic plugs can relax their torque thus “factory torqued” plugs may not stay that way and should be verified.

Further cap seals are just that-seals. If a vented closure is required of a lading a cap seal can seal off the vented plug allowing for potentially dangerous pressure build up in the drum. Vented or less occlusive plug caps are available and should be used with vented plugs.

DIP TUBES AND EXTRACTION VALVE ASSEMBLIES

As more users strive to keep their purchased product clean as possible and address employee safety, drums can be outfitted at MPS with extraction valves and dip tubes. These systems reduce the potential for human contact and many are totally closed, keeping dust and dirt out of the product. For self-installation these are suggested torques as they represent the values used for factory installed units. Manufacturers’ specific recommendations should always be consulted—these are only a guide.

	Part Size / Description	Closure Torque
A	QC System DT3 Drum Insert buttress: Polyethylene gasket	25-30 ft-lbs
B	QC System DT3 Shipping Cap	6 ft-lbs

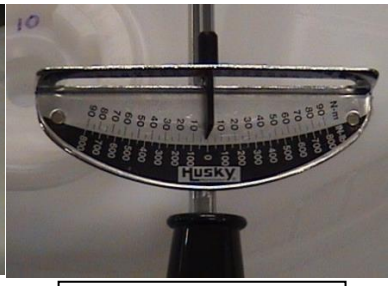
C	Micro Matic EPV: plastic w/FKM or EPDM gaskets	20-25 ft-lbs
D	Micro Matic RSV: stainless steel w/FKM, EPDM, or PE gaskets	20-25 ft-lbs
E	Colder Products Drum Quick Pro buttress and NPS: FKM, Buna, EPDM, or Silicone gaskets	20-25 ft-lbs
F	Colder Products Drum Quick Pro buttress and NPS: Polyolefin gasket	25-30 ft-lbs
G	Entegris QCII Shipping Cap	7-8 ft-lbs
H	Entegris QCII Drum Insert	20-25 ft-lbs
I	Entegris QCIII	20-25 ft-lbs
J	Taylor Cain DV-155	5 ft-lbs
K	Taylor Cain A-PIC-36	36 ft-lbs

TORQUE WRENCHES

The following are photographs of various torque wrenches MPS has found suitable to apply the required closing torque. These are typical units and other brands of adjustable wrenches are acceptable. These should be regularly calibrated.



Dial Indicating and Adjustable Torque Wrench



Husky Brand Indicating Wrench



Rieke Brand Preset Wrenches

Revision history:

Version	Description	Prepared by	Effective Date
MC/PAS-QA-103 REV. 14	1. Non removable head drums: updated closure torque for 2" NPS/NPT and Buttress closures; updated part #s for ACT drums 2. Removable head drums: added closure torque for ¾" NPS/NPT closures w/Santoprene gasket	T.Smoleeva	10/29/2026