



CLOSING INSTRUCTIONS FOR UN TIGHTHEAD DRUMS (1H1) AND JERRICANS (3H1)

Customer Document No. ETS-CD-1012

STATEMENT OF NOTIFICATION REQUIREMENTS

These instructions are provided by Mauser Packaging Solutions (MPS) to the filler of UN certified plastic packaging marketed under the BWAY, NAMPAC, or K LW brand names in accordance with §178.2(c) of the U.S. Department of Transportation's (DOT) hazardous materials regulations, Title 49 of the Code of Federal Regulations (CFR). The instructions apply exclusively to 1H1 and 3H1 single unit packaging of the type and style as described herein and bearing a UN certification marking. At the time of transfer, any package or packaging component supplied by MPS does not meet the UN standard because it is disassembled. Only when assembled in the manner, and using the components described herein, is this packaging certified by MPS to meet the UN standard.

It is the regulatory obligation of the packaging filler to properly assemble and close UN certified packaging. If the packaging is not assembled and closed per these instructions, or if any of the components are omitted or replaced with substitute components, this packaging is not certified by MPS as meeting the UN performance standard. It is the regulatory obligation of the shipper to determine that the filled package is authorized for transportation. When transporting by air, the general requirements for transportation by aircraft in §173.27 of Title 49 CFR must also be met.

SCOPE OF CLOSING INSTRUCTIONS – PACKAGINGS INCLUDED

The instructions contained herein apply to self-stacking round tighthead drums and square/rectangular tighthead jerricans in sizes of 15-gallon and under manufactured and sold by Mauser Packaging Solutions under the BWAY, NAMPAC, and K LW brand names. These packages are hazmat rated for UN-LIQUIDS. UN MARKINGS may appear on the top or sidewall of the container. The package, when properly closed per these instructions, shall be rated to the UN marking embossed into the container.

SCOPE OF CLOSING INSTRUCTIONS – PACKAGINGS EXCLUDED

- PEPSI Small Form EZ Pour tightheads (2-gallon and under) are not covered under these instructions (See ETS-CD-1031).
- AutoChlor 10-Liter jerricans with RDI dip tubes are not covered under these instructions (See ETS-CD-1032).
- These instructions DO NOT apply to MPS tighthead drums and jerricans when used as an inner packaging of a 4G package.

APPLICABLE MPS UN 1H1 and 3H1 COMPONENTS

The instructions found in this closure document are applicable to the following molded plastic containers as manufactured and sold by Mauser Packaging Solutions and their associated closures.

1H1 ROUND TIGHTHEAD DRUM:

- UN Rated Round tighthead Drums (15 Gallon & Below)
- UN Rated Large Drums (30 Gallon – 60 Gallon)

3H1 SQUARE, RECTANGLE and DELEX JERRICANS:

- UN Rated (STH-Series) Square tighthead (4 Gallon thru 7 Gallon)
- UN Rated (RTH-Series) Rectangle tighthead/swing handle (4 Gallon thru 6 Gallon))
- UN Rated (RST-Series) Rectangle tighthead/integrated handle (4 Gallon thru 7 Gallon)
- UN Rated (DLX-Series) Delex tighthead (20 Liter/5 Gallon)
- UN Rated SQRD Jerrican tighthead (3 Gallon – 6 Gallon)
- UN Rated SI-Series Rectangular tighthead/integrated handle (13 Liter thru 27 Liter)
- UN Rated EG-Series Rectangular tighthead/integrated handle
- UN Rated 10-liter jerricans, multiple styles

CLOSURES:

- 45mm DIN Screw Cap (4mm pitch, approx. 6tpi)
 - 50/51mm DIN Screw Cap (6mm pitch, approx. 4tpi)
 - 60/61mm DIN Screw Cap (6mm pitch, approx. 4tpi)
 - 63mm Screw Cap (8tpi)
 - 70mm Screw Cap (6tpi & 8tpi)
 - 70 mm Screw Cap with pTfe Membrane Vent (6tpi & 8tpi)
 - Crimp-On Pour Spouts
 - American Flange Tab Seal Pour Spout (Crimp-On)
 - 2 inch & 56mm Internal Buttress Bung Plugs
 - 2 Inch Internal Buttress Bung Plug with microporous vent
 - American Flange / Tri-Sure Plastiplug
- (Note: All closures listed above include plain and tamper-evident versions where applicable)**

VENTS:

- ¾" bung plug
- ¾" plug vents with membrane
- ¾" Acorn vents
- 18mm vent
- 22mm vent
- 24mm vent
- 28mm vent
- 22/24mm captive vent

45, 50/51, 60/61, 63 and 70mm Screw Cap Closure Instructions

PURPOSE:

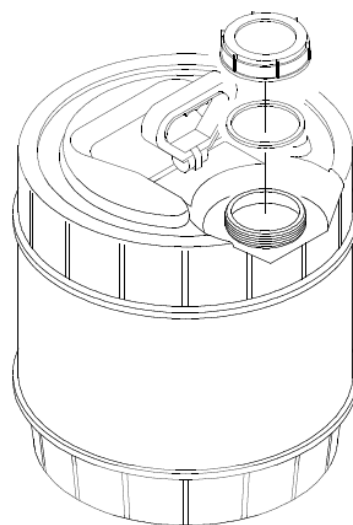
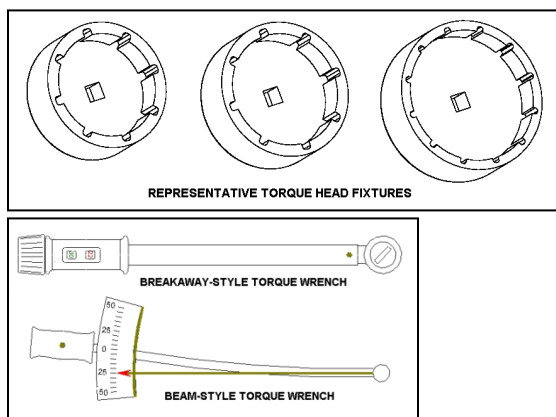
To ensure that the threaded screw cap is properly sealed when assembled onto MPS's jerricans and tighthead drums. The DOT/UN Performance Certification only applies to a Tight Head Container that is closed per this procedure.

SIGNIFICANCE:

The sealing performance of the Cap is compromised if the top surface of the neck is rough, has a burr, or is not clean; in addition, if the gasket in the cap is not properly seated in the O-Ring groove, twisted, or is not clean. The Caps are only to be assembled on the jerrican after all sealing surfaces pass inspection.

APPARATUS:

- 50/51, 60/61, 63 or 70mm Torque Head Fixture
- Torque Wrench (Adjustable from 10 - 15 ft-lbs or 120 - 180 in-lbs)
- The use of a calibrated automatic torque application machine is permissible if it does not damage the threads or seating surface of the container.



permissible if it

PROCEDURE:

1. Inspect the top surface of the neck to ensure an acceptable sealing surface, clean and free of any debris.
2. Inspect the cap to ensure the gasket is properly assembled and is clean.
3. Start the cap on the neck by hand, rotating the cap in a clock-wise direction. Take care not to cross thread the cap; this will result in damage to the cap or to the neck finish.
4. Using the 50/51, 60/61, or 70mm torque head fixture mounted onto a torque wrench, tighten the cap per the table below.

CAP SIZE (DIA)	Thread Pitch	INSTALLATION TORQUE
45mm	4mm (6tpi)	144 IN-LBS (12 FT-LBS)
50/51mm	6mm (4TPI)	180 IN-LBS (15 FT-LBS)
60/61mm	6mm (4TPI)	180 IN-LBS (15 FT-LBS)
63mm	8TPI (3mm)	120 IN-LBS (10 FT-LBS)
70mm	8TPI (3mm)	120 IN-LBS (10 FT-LBS)
70mm	6TPI (4mm)	120 to 150 IN-LBS (10 to 12.5 FT-LBS)
NOTE Application torques show above apply to both plain and tamper evident closures		

2” Buttress or 2” NPT Bung Plug Closure Instructions

PURPOSE:

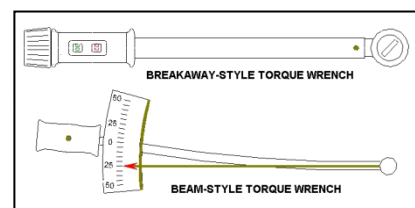
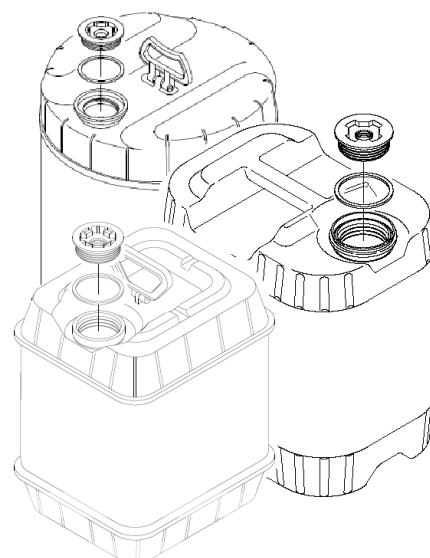
These instructions are designed to ensure the proper installation of any one of several 2” buttress threaded bung plugs into jerricans and tighthead drums produced by Mauser Packaging Solutions. The UN Regulated Container Certification applies to marked UN 1H1 and 3H1 Tight Head packages that are closed per this procedure.

SIGNIFICANCE:

The sealing performance of the Bung Plug can be compromised if the top gasket sealing surface of the neck is rough, has a burr, or is not clean; in addition, if the gasket on the Bung Plug is not properly seated in the O-Ring groove, is twisted, or is not clean. The Bung Plugs are only to be assembled on the jerrican after all sealing surfaces have passed visual inspection.

APPARATUS:

- Torque wrench of suitable measuring capacity (25 ft-lbs minimum), digital breakaway style preferred
- Torque Wrench Fitting specific to the bung plug being installed. Fitting should be shape matched to and fit securely inside the center impression in the bung plug and mount directly to the torque wrench shaft. Contact the specific bung plug manufacturer for additional Torque Wrench Fitting information.
- The use of a calibrated automatic torque application machine is permissible if it does not damage the threads or seating surface of the container.



ASSEMBLY INSTRUCTIONS:

1. Verify that the top sealing surface of the container neck is clean and free of defects or debris. Clean as needed.
2. Verify that the gasket is properly placed onto the closure and fully seated against the closure flange. Install or adjust the gasket if required and ensure that the gasket surfaces are free of defects or debris.
3. Start the bung plug into the container neck by hand, turning clockwise until the threads have engaged.
4. Use the manual or mechanical Torque Wrench and Torque Wrench Fitting as described above to finish seating the closure to the recommended torque (see **Closure Application** table).

2” Bung Plug Closure Style	Gasket Material	Application Torque for 100 kPa rating	Application Torque for 150 kPa rating
Wolverine 2” Buttress Plug, Plain	EPDM	20 ft-lbs (240 in-lbs)	20 ft-lbs (240 in-lbs)
Wolverine 2” Buttress Plug, Vented	EPDM	20 ft-lbs (240 in-lbs)	N/A
Wolverine 2” Buttress Plug	B4	N/A	25 ft-lbs (300 in-lbs)
Rieke PP57-B-5 2” Buttress Plug	EPDM	20 ft-lbs (240 in-lbs)	20 ft-lbs (240 in-lbs)
Rieke PP57-B-5 2” Buttress Plug, Vented	EPDM	25 ft-lbs (300 in-lbs)	N/A
Brandt/Mauser 2” Buttress Plug	EPDM	N/A	25 ft-lbs (300 in-lbs)
Tri-Sure (American Flange) 2” PlastiPlug	EPDM	20 ft-lbs (240 in-lbs)	25 ft-lbs (300 in-lbs)

63mm Crimp-On Fitting Closure Instructions

PURPOSE:

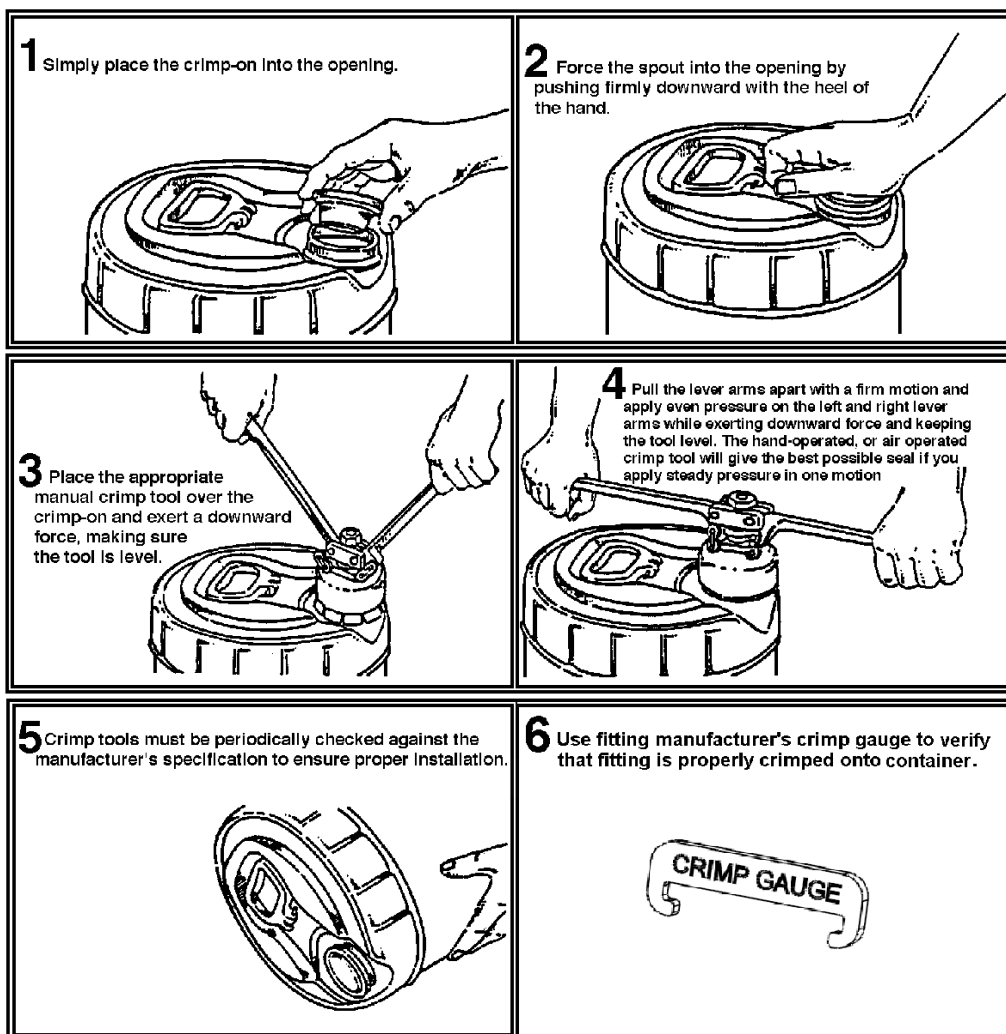
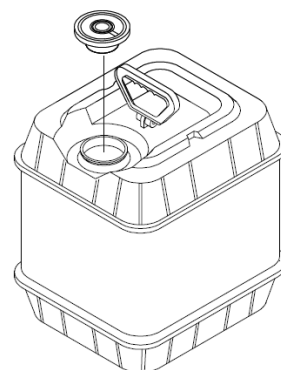
These instructions are designed to ensure the proper installation of any one of several 63mm crimp-on fittings onto jerricans and tighthead drums produced by Mauser Packaging Solutions. The UN Regulated Container Certification applies to marked UN 1H1 and 3H1 Tight Head packages that are closed per this procedure.

SIGNIFICANCE:

The sealing performance of the UN components can be compromised if the components have been damaged in shipment or handling. Ensure that the crimp bead around the top of the container neck is clean and free of burrs, ragged edges, or other defects and verify that the inner surface of the fitting is clean and defect free before assembling the components.

APPARATUS:

- Manual or automatic multi-jaw crimp head (manual model shown in instruction diagrams)



3/4” NPS Bung Plug Closure Instructions

PURPOSE:

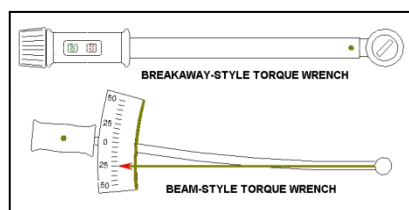
These instructions are designed to ensure the proper installation of any one of several vented and non-vented 3/4” NPS threaded bung plugs into the vent orifice on jerricans and tighthead drums produced by Mauser Packaging Solutions.

SIGNIFICANCE:

The UN Regulated Container Certification applies to marked UN 1H1 and 3H1 Tight Head packages that are closed properly, as per this procedure. Failure to follow this procedure may render the UN certification null. The sealing performance of the UN components can be compromised if the components have been damaged in shipment or handling and all components should be inspected prior to cover application.

APPARATUS:

- Torque wrench of suitable measuring capacity (25 ft-lbs minimum), breakaway style preferred
- Torque Wrench Fitting specific to the bung plug being installed. shape matched to and fit securely inside the center impression in and mount directly to the torque wrench shaft. Contact the specific manufacturer for additional Torque Wrench Fitting information.
- The use of a calibrated automatic torque application machine is permissible if it does not damage the threads or seating surface of the container.



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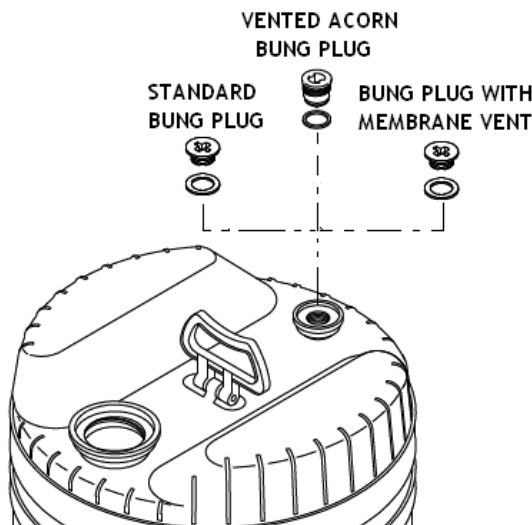
Fitting should be the bung plug bung plug

ASSEMBLY INSTRUCTIONS:

1. Verify that the top sealing surface of the container vent is clean and free of defects or debris. Clean as needed.
2. Verify that the gasket is properly placed onto the closure and fully seated against the closure flange. Install or adjust the gasket if required and ensure that the gasket surfaces are free of defects or debris.
3. Start the vent plug into the container neck by hand, turning clockwise until the threads have engaged.
4. Use the manual or mechanical Torque Wrench and Torque Fitting as described above to finish seating the closure to the recommended torque (see **Plug Installation Torque** table

Wrench below).

Vent Plug Type	Installation Torque
3/4” Standard Bung Plug	85 in-lbs (7 ft-lbs)
3/4” Bung Plug with Membrane	85 in-lbs (7 ft-lbs)
3/4” Vented ACORN Bung Plug	85 in-lbs (7 ft-lbs)



18, 22, 24 and 28mm Screw Cap Vent Closure Instructions

PURPOSE:

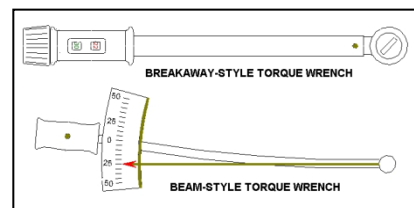
These instructions are designed to ensure the proper installation of 18, 22, 24, and 28mm screw caps onto their respective threaded vent openings on jerricans and tighthead drums produced by Mauser Packaging Solutions. The UN Regulated Container Certification applies to marked UN 1H1 and 3H1 Tight Head packages that are closed per this procedure.

SIGNIFICANCE:

The sealing performance of the UN components can be compromised if the components have been damaged in shipment or handling and all components should be inspected prior to cover application.

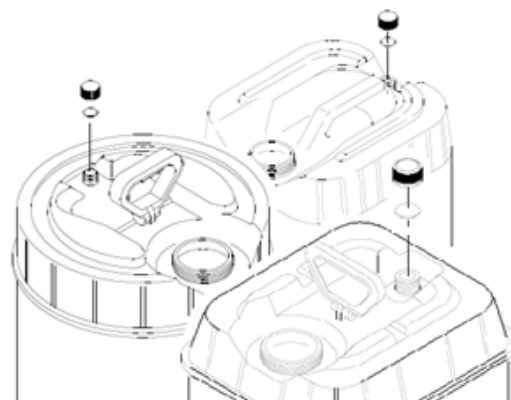
APPARATUS:

- Torque wrench of suitable measuring capacity (25 ft-lbs minimum), digital breakaway style or T-Handle preferred.
- Torque Wrench Head Fixture specific to the screw cap being installed. Wrench Head should be shape matched and fitted securely to the outer diameter of the screw cap and mount directly to the torque wrench shaft. Contact the specific screw cap manufacturer for additional Wrench Head Fixture information.



ASSEMBLY INSTRUCTIONS:

1. Verify that the top sealing surface of the container vent is clean and free of defects or debris. Clean as needed.
2. Verify that the gasket is properly placed inside the closure and fully seated against the closure's top inner surface. Install or adjust the gasket if required and ensure that the gasket surfaces are free of defects or debris.
3. Start the screw cap onto the container neck by hand, turning clockwise until the threads have engaged.
4. Use the manual or mechanical Torque Wrench and Torque Wrench Fitting as described above to finish seating the closure to the recommended torque (see **Closure Application Torque** table below).



Screw Cap Size	Application Torque
18mm SP400	15 in-lbs (1.3 ft-lbs)
22mm SP400	20 in-lbs (1.6 ft-lbs)
24mm SP400	23 in-lbs (1.9 ft-lbs)
28mm SP400	25 in-lbs (2.0 ft-lbs)

21/24mm Captive Screw Cap Vent Closure Instructions

PURPOSE:

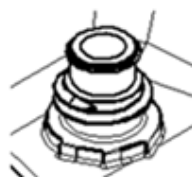
These instructions are designed to ensure the proper installation of 21/24mm captive screw caps onto the mating threaded vent nipple on jerricans and tighthead drums produced by Mauser Packaging Solutions. The UN Regulated Container Certification applies only to marked UN 1H1 and 3H1 Tight Head packages that are closed per this procedure.

SIGNIFICANCE:

The sealing performance of the UN components can be compromised if the components have been damaged in shipment or handling and all components should be inspected prior to cover application.



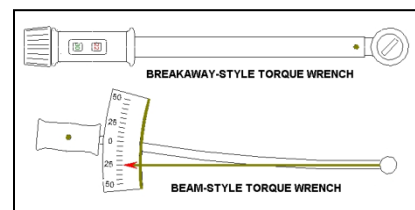
21/24mm Captive Closure



21/24mm Vent Nipple

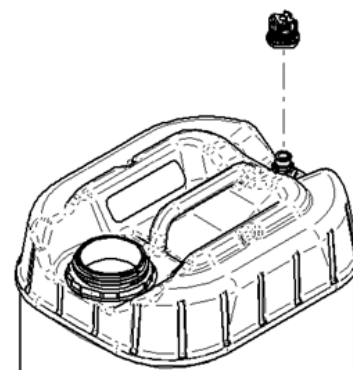
APPARATUS:

- Torque wrench of suitable measuring capacity (20 in-lbs minimum), digital breakaway style or T-Handle preferred.
- Torque Wrench Head Fixture specific to the screw cap being installed. Wrench Head should be shape matched and fitted securely to the outer diameter of the screw cap and mount directly to the torque wrench shaft. Contact the specific screw cap manufacturer for additional Wrench Head Fixture information.



ASSEMBLY INSTRUCTIONS:

1. Verify that the top sealing surface of the container vent is clean and free of defects or debris. Clean as needed.
2. Verify that the gasket is properly placed inside the closure and fully seated against the closure's top inner surface. Install or adjust the gasket if required and ensure that the gasket surfaces are free of defects or debris.
3. Press the closure downward to snap it onto the vent nipple, then turn the closure clockwise until the threads have engaged.
4. Use the manual or mechanical Torque Wrench and Torque Wrench Head Fixture as described above to finish seating the closure to the recommended torque.
5. Application torque for this closure is **20 in-lbs (1.6 ft-lbs)**.



CLOSURE TOOL REFERENCE TABLE

Closure Mfg'r	Closure Types	Closure Size (mm)	Closure Tool Model	Closure Tool Description
Various	Vent Caps	18,22,28		T-Handle Torque wrench
American Flange	Tri-Sure Tab Seal		UG	Manual Crimping Tool
	Tri-Sure Uni-Grip		UAG	Pneumatic Crimping Tool
Norpak / Norton	Norcap	70		Seekonk Torque Wrench (Gauge) or Equivalent with Rieke Cap Wrench Adapter, W394; or contact your Norpak/Norton representative for equivalent adapter
	Norcap Vented			
Republic	Comack	70		Seekonk Torque Wrench (Gauge) or Equivalent with Rieke Cap Wrench Adapter, W394; or contact your Republic representative for equivalent adapter
	Comack TEXT			
	SC63R Vented			
Brandt (MAUSER)	Brandt 70mm Brandt 70 Vented Brandt 70mm TE	70		Seekonk Torque Wrench (Gauge) or Equivalent with Rieke Cap Wrench Adapter, W394; or contact your BWAY representative for equivalent adapter
Brandt (MAUSER)	Brandt 61mm Brandt 61 Vented Brandt 61mm TE	61		Seekonk Torque Wrench (Gauge) or Equivalent with Rieke Cap Wrench Adapter, W394; or contact your BWAY representative for equivalent adapter
BeriCap	60/61mm DIN	60/61		Seekonk Torque Wrench (Gauge) or Equivalent with Rieke Cap Wrench Adapter, W394; or contact your BWAY representative for equivalent adapter
Westphal Lange	Westphal Lange 61mm TE	61		Seekonk Torque Wrench (Gauge) or Equivalent with Rieke Cap Wrench Adapter, W394; or contact your BWAY representative for equivalent adapter
Brandt (MAUSER)	Brandt 51mm Vented	51		Seekonk Torque Wrench (Gauge) or Equivalent with Rieke Cap Wrench Adapter, W394; or contact your BWAY representative for equivalent adapter
Rieke	FS-60	70		Seekonk Torque Wrench (Gauge) or Equivalent with Rieke Cap Wrench Adapter, W394
	FS-70 FS-70 TE FS-70 Vented			
	SC-76 SC-76 TE			
	FS-80 FS-80 TE FS-80 Vented			
	SC-86 SC-86 TE			
Rieke/Bomag/Technocraft Pour Spouts	FS-10-6-300 FS-10-6-624 FS-10-8V-300 FS-300 FS-II		FS-600 IA-FS-600 HFS-600	Manual Flexspout Crimping Tool Airmatic Flexspout Crimping Tool Airdraulic Flexspout Crimping Head and Hose
	Bomag Crimp-on		FS-600 IA-FS-600 HFS-600	Manual Flexspout Crimping Tool Airmatic Flexspout Crimping Tool Airdraulic Flexspout Crimping Head and Hose
	Technocraft Crimp-on		FS-600 IA-FS-600 HFS-600	Manual Flexspout Crimping Tool Airmatic Flexspout Crimping Tool Airdraulic Flexspout Crimping Head and Hose

<p>MAUSER PACKAGING SOLUTIONS – PLASTIC MANUFACTURING LOCATIONS – SMALL CONTAINERS</p>

Bryan, Texas, 1591 N. Harvey Mitchell Parkway, Bryan, Texas 77803

Cedar City, Utah, 1033 N. Production Road, Cedar City, Utah 84721

Cidra, Puerto Rico, Road 172 KM 13.4, Cidra, Puerto Rico 00739

Dayton, New Jersey, 7 Wheeling Road, Dayton, New Jersey 08810

Elk Grove Village, Illinois, 1350 Arthur Avenue, Elk Grove Village, Illinois 60007

Elk Grove Village, Illinois, 2350 Lively Boulevard, Elk Grove Village, Illinois 60007

Indianapolis, Indiana, 6061 Guion Road, Indianapolis, Indiana 46254

LaGrange, Georgia, 1603 Orchard Hill Road, LaGrange, Georgia 30240

Langley, British Columbia, Canada, 5850-272nd Street, Langley, British Columbia, Canada V4W 3Z1

Leominster, Massachusetts, 196 Industrial Road, Leominster, Massachusetts 01453

Mansfield, Texas, 1501 East Dallas Street, Mansfield Texas 76063

Monroe, Ohio, 980 Deneen Avenue, Monroe, OH 45050

Newnan, Georgia, 98 Amlajack Boulevard, Newnan, Georgia 30265

Oakville, Ontario, Canada, 2240 Wyecroft Road, Oakville, Ontario, Canada L6L 6M1

Springhill, Nova Scotia, Canada, 29 Memorial Crescent, Springhill, Nova Scotia, Canada B0M 1X0

Valparaiso, Indiana, 4002 Montdale Drive, Valparaiso, Indiana 46383

For more information on Mauser Packaging Solutions, visit our website at: <https://www.mauserpackaging.com>

Revision History:

Version	Description	By	Date
4.5	Updated to Mauser Packaging Solutions format.	F. Burney	15-Aug-2018

5.0	Updated Application Torque Chart for 2" Plugs, Expanded Scope of Instructions	F. Burney	01-Mar-2019
5.1	Placed steps for crimping on spouts into correct order. Corrected web address.	F. Burney	25-Jun-2019
5.2	Clarified that application torque requirements apply to both TE and non-TE closures	F. Burney	08-Jan-2020
6.0	Added 45DIN closures, updated some nomenclature, added Monroe OH facility	F. Burney	31-May-2022

**MAUSER PACKAGING SOLUTIONS
ACKNOWLEDGEMENT OF RECEIPT OF ETS-CD-1012
UN 1H1 AND 3H1 CLOSED-HEAD PACKAGING NOTIFICATION**

I acknowledge receipt of this manual from MAUSER PACKAGING SOLUTIONS. I understand that the material contained in this manual SHOULD BE USED TO DETERMINE COMPLIANCE with the U.S. Department of Transportation hazardous materials regulations.

Date Signature

Please Print

Name

Title

Company

Street Address

City

State

Zip Code

Mailing Address

City

State

Zip Code

Please return this sheet to:

**Mauser Packaging Solutions
Engineering Test Lab
1603 Orchard Hill Road
LaGrange, GA 30240
706-756-3389
robert.burek@mauserpackaging.com**

Retain a copy of this sheet for your records: