



**RECOMMENDED  
PRACTICE  
SEAL-LOCK APEX  
&  
SEAL-LOCK APEX-E**

APPROVED	INITIALS	DATE
Prepared By	RBI	12/30/18
Engineer	SJH	01/24/19
GM QA	GJR	12/26/18
REVISION	016	01/25/19

**SUBJECT: FIELD RUNNING AND HANDLING PROCEDURES**

**1.0 SCOPE**

- 1.1 This document sets forth Hunting's recommended practice for the field running and handling procedures that should be used in conjunction with the **SEAL-LOCK APEX** carbon and chrome casing product line.

**2.0 REFERENCES**

- 2.1 The following documents were used for reference in the preparation of this document:
- 2.1.1 API RP 5C1
  - 2.1.2 API BUL. 5A3

**3.0 EQUIPMENT**

- 3.1 The following list of equipment should be on location when **SEAL-LOCK APEX** casing is run:
- 3.1.1 Ample supply of fresh, unopened **approved** thread compound.

**NOTE: For thread compounds, please refer to Hunting's website to verify the current Recommended Thread Compounds approved by Hunting – Per Connection List.**

To access the list, visit [www.hunting-intl.com](http://www.hunting-intl.com), click on "Connection Technology" and look for the link: "Recommended Thread Compounds approved by Hunting".

**WARNING: Hunting "DOES NOT" recommend any thread lubricant with large particles such as Best-O-Life 2000 on its metal-to-metal sealing connections. It has been proven to compromise connection integrity on Hunting's metal-to-metal sealing connections.**

- 3.1.2 Thread lubricant applicators #58235 moustache brush.
- 3.1.3 Hunting's field service kit.
- 3.1.4 Appropriate sales data sheet.
- 3.1.5 **VISUAL THREAD INSPECTION**, Ancillary Specification.
- 3.1.6 **STEEL IMPERFECTIONS**, Ancillary Specification.
- 3.1.7 Molybdenum disulfide spray
- 3.1.8 **RECOMMENDED** - Torque turn monitoring equipment.
- 3.1.9 **RECOMMENDED** - WD-40.

**4.0 FIELD RUNNING AND HANDLING PROCEDURES**

- 4.1 Precaution
- 4.1.1 Tubulars should not be stacked higher than five tiers at the rig. (API RP 5C1).
  - 4.1.2 Layers should be separated by wooden dunnage, one at each end and one in the center of the tube, per layer, so that no weight rests on the connections. (API RP 5C1).
  - 4.1.3 Thread protectors should always remain in place when moving or handling tubulars.
  - 4.1.4 If a mixed string is to be run, ensure proper identification to accommodate sequence of running.
  - 4.1.5 Do not use a welding torch to remove thread protectors.
  - 4.1.6 Avoid rough handling. Do not unload pipe by dropping.



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- 4.1.7 Do not handle more than three joints unless the pipe is packaged or bundled.
- 4.1.8 Never use hooks on the ends of pipe; handle with slings.

**NOTE: For CRA material, pipe racks and lift trucks should be coated with a non metallic material.**

**NOTE: The following precautions should be observed when handling casing and tubing:**

- a. Before loading or unloading make sure that the thread protectors are tightly in place. Do not unload pipe by dropping. Avoid rough handling which might damage the threads or ding or dent the body of the pipe. Damaged threads may leak or part. Dents and out-of-roundness may reduce the collapse resistance of the pipe.
- b. Special handling may be required for sour service and CRA material. Impact against adjacent pipe or other objects may cause a local increase in the hardness of the pipe to the extent that they become susceptible to sulfide stress cracking. The owner of pipe that requires special handling requirement should notify his service providers of the applicable special handling requirements and to which pipe the special requirements are applicable.
- c. When unloading by hand, use rope slings to control the pipe. When rolling down skids, roll pipe parallel to the stack and do not allow pipe to gather momentum or to strike the ends, because even with thread protectors in place there is danger of damaging the threads.
- d. When using a crane, the use of spreader-bar with a choker-sling(s) at each end is the recommended method of handling long pipe. Each choker-sling shall be double wrapped.
- e. When rolling pipe on the rack, keep pipe parallel and do not allow pipe to gather momentum or to strike the ends.

4.2 Preparation

- 4.2.1 By visual inspection, ensure that all necessary running equipment and accessories (subs, crossovers, nipples, gas lift mandrels, lifting/handling plugs, hangers, pup joints, etc.) are available and in good condition. Document condition in tally book.

**NOTE: Following a thorough review of running/accessory equipment, discuss running procedures with drilling supervisor.**

- 4.2.2 Slip type elevators of proper size, in good repair and with the setting plate adjusted properly, should be used.

**NOTE: Hunting does not recommend the use of bottleneck or shoulder type elevators.**

- 4.2.3 Ensure that slips are of the correct size to accommodate the size, weight and length of the tube.
- 4.2.4 Ensure that the safety clamp is the correct size and in serviceable condition.
- 4.2.5 Check for traveling block alignment.



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- 4.2.6 Ensure that all accessories are available and in good condition, including crossovers, float equipment, etc. and if appropriate, that the proper service personnel are present and aware of the procedures.
- 4.2.7 Ensure that an ample supply of the approved thread compound is available. Only fresh, previously unopened containers of compound shall be used.

**NOTE: Hunting recommends the use of non directional inserts for CRA material in elevators and slips; non directional low stress inserts in tongs.**

**NOTE: When running with a CRT (Casing Running Tool) no dump valve shall be used and a 5 to 8 second torque shall be applied.**

**NOTE: When running with a CRT (Casing Running Tool) Hunting recommends the use of a compensator.**

**NOTE: Hunting recommends CRT (Casing Running Tool) not to be used for CRA material.**

**NOTE: See Section 3.1.1 for recommended thread compounds.**

- 4.2.8 A stabbing board or a yoke may be required to offer stability for ease of make-up.
- 4.2.9 Ensure that the power tong snub line is at 90° and level with the tong.

**NOTE: Ensure that an accurate torque monitoring device (Martin-Decker torque gauge) is available, the load cell is for use in the required torque range, and the load cell has been calibrated within the past six (6) months.**

- 4.3 Cleaning and Thread Inspection
  - All tubular connections shall be thoroughly cleaned and dried at the rig prior to running or inspection.
  - 4.3.1 Immediately before running, remove protectors from both the field end and the coupling. Clean each connection and protector thoroughly.
  - 4.3.2 All compounds that have been applied to the connections and protectors are to be wiped off or washed off using solvent and a non-metallic bristle brush. Wipe out or blow out the solvent from the connection or protector after washing.

**NOTE: If steam is used to clean the connections assure that the connections are thoroughly dried following the steaming operation and that no water remains in the pipe or in the threaded areas. In freezing temperatures be aware that water remaining on the threaded areas will freeze and the ice must be removed prior to thread compound application or galling of the threads may occur.**

**NOTE: Care must be taken to ensure that the cleaning process does not cause environmental pollution.**



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- 4.3.3 Check and clean the inside of the tubulars to eliminate any foreign material that may fall into the box while stabbing. If compressed air is available, air blast from box to pin. Ensure that there are no bristles left on the threads from cleaning.
- 4.3.4 Drift the pipe and accessory equipment with a clean, properly sized mandrel. Drift shall be performed box to pin, being careful not to damage the box torque shoulder, seal, or threads when placing the mandrel in the joint.
- 4.3.5 Inspect the threaded connections using Hunting's Ancillary Specifications titled **VISUAL THREAD INSPECTION** and **STEEL IMPERFECTIONS**.

**NOTE: Repair as required by VISUAL THREAD INSPECTION and/or STEEL IMPERFECTION ANCILLARY SPECIFICATIONS.**

- 4.3.6 If any joint shows obvious ovality, it should not be run.
- 4.3.7 Never leave the threads exposed for longer than two hours without corrosion protection. If the connection is cleaned more than two hours but less than twelve hours before the joint is run, a light oil such as WD-40, should be used to prevent corrosion. If it will be more than twelve hours until a joint is to be run, reapply thread compound and clean thread protectors.

4.4 Running

- 4.4.1 Thread protectors must be in place whenever tubulars are moved.

**NOTE: While moving tubulars, do not lift with a hook that may/will contact the box/coupling thread or seal or the pin face.**

- 4.4.2 Joints should be moved to the V-door via a pick-up machine. If a pick-up machine is unavailable, joints should be moved to the V-door by slings or a pick-up line attached to the box end.
- 4.4.3 Elevators or pick-up line with or without pick-up elevators may be used to lift the joint up in the derrick.
- 4.4.4 If CRT (casing running tool) is to be used, remove the thread protector and replace it with a Hunting internal tool guide / handling plug.

**NOTE: Hunting connections are not interchangeable with any other connections in the industry. The use of an internal tool guide / handling plug different than the ones designed by Hunting Energy Services for specific connections or applications may result in property damage, injury, or death. Hunting will not be held accountable nor accept any liability if the proper equipment is not utilized for its intended purpose.**

- 4.4.5 Clean and re-inspect each connection as it hangs in the derrick. After removing the protector, remove any thread compound, solvent or moisture remaining on the connection.
- 4.4.6 Visually inspect to assure no damage to either connector has occurred.



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**NOTE:** For CRA material, molybdenum disulfide spray should be applied to pin and box/ coupling connections.

4.4.7 After the connection is clean and dry, apply a light even coating of the thread compound to the pin and coupling connectors.

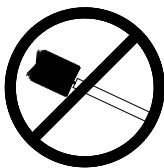
**NOTE:** A light even coating of thread compound is defined as all thread surfaces, root and crest, seal surfaces and pin face/torque shoulder covered with an even coat of thread compound. However, the thread form should remain clearly visible. It should be noted that in severe service situations thread compound may be applied only to the box seal and the entire pin threaded surfaces.

**NOTE:** Assure that the coupling relief groove is not filled with thread compound. If excess thread lubricant is in the groove, remove the excess with a clean, dry rag or paper towel.

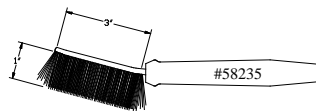
**NOTE:** Adjust the amount of lubricant applied to the pin and coupling connectors to cause a gradual increase in torque throughout the make-up.

**NOTE:** An indicator of connection over-lube is during the last one-half of a turn to final make-up position there is no gradual increase of torque even though the pin is continuing to advance into the coupling.

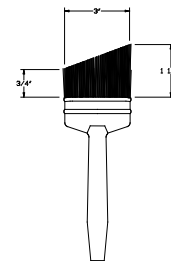
**CAUTION:** Too much thread lubricant can cause connection damage. The problem is heightened with a high make-up speed.



Do Not Use  
Bottle Brush



Preferred Moustache Brush #58235



Alternate Acceptable  
Modified Paint Brush

4.4.8 Use an alignment yoke to assist make-up.

4.4.9 Stab the pin connector into the box connector.

**NOTE:** Without the stabbing guide in place on the box connector, have the driller position the first pin to be made-up over the box connector (stump) and check the pin to box alignment. The pin should be allowed to hang free in the elevators while the alignment is being determined. The pin should be able to be stabbed directly into the box without assistance from one of the drilling crew members.



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4.4.10 If the connection is mis-stabbed, pick up the joint, wipe away the thread compound on the pin and the box connectors and inspect for damage. Repair if necessary.

4.5 Make-up

4.5.1 Optional Torque-Turn Equipment.

A torque turn/time or torque/turn monitoring system may be utilized. Monitoring equipment should be capable of resolving torque to 1/100th of a turn increments as a minimum but equipment capable of resolving torque to 1/1000th of a turn encoder should be utilized when available. An enhanced computer display should be part of the torque-turn monitoring equipment and utilized to monitor make up. The monitoring equipment should be capable of dumping during the make-up by either the computer technician or when maximum parameters are reached. As the torque enters the acceptable window, the technician should be able to depress a function key to manually terminate the make-up. The system should be capable of automatic dumping as input parameters are met. The load cells used with the torque monitoring equipment should be calibrated every six (6) months, traceable to the appropriate national standard.

4.5.2 Back-up tongs should be placed below the coupling. Use back-up tongs for the first 10 joints or until sufficient weight is generated in the slips to prevent the entire string from rotating.

**NOTE: Power and backup tong dies shall be clean and not worn down and shall not leave marks exceeding 0.015" in depth. Excessive marks or sharp-bottomed marks must be removed. Removal may be by filing only; grinding is prohibited.**

4.5.3 Position the power tongs approximately 7" above the coupling.

**NOTE: For CRA material the connection shall be started by hand and/or with a strap wrench.**

**NOTE: The normal published torque window is based on dimensional tolerances and friction factors. Other factors affecting torque are texture of phosphate coating, type of thread lubricant, make-up speeds, temperature, etc. For sizes 7" and above, the important feature of SEAL-LOCK APEX is for the connection to achieve a shoulder with minimum of 1,000 ft/lbs (delta) torque prior to reaching 80% of the published minimum yield torque value stated on the appropriate connection data sheet. All other sizes below 7" refer to sales data sheet. In severe service applications, such as very low temperature situations, the recommended torque range may be increased upon approval, contact Hunting's Q.A. Department.**

**NOTE: SEAL-LOCK APEX is a 5 ¼ turn make-up connection from stab to the shouldered condition. The first 3 ½ -to 4 make-up turns should be below the 250 ft/lb reference torque. If the connection begins to show over the 250 ft/lbs torque prior to the 3 ½ turns, stop the make-up, recheck the alignment, if possible make a revolution using a chain tong and resume the make-up. There should be no more than 1 ½ turns of**



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building torque until the connection shoulders. Small torque excursions that exceed the maximum torque are not cause for rejection of the make-up.

**NOTE:** If a spider is used in conjunction with the slips and above the Kelly bushing/rig floor, following the alignment procedure, the spider should be chained in place.

**NOTE:** Do not allow the stabber to rock the tube during make-up.

**NOTE:** If the connection is mis-stabbed, do not back out the connection with the tongs. If a connection is mis-stabbed, remove the power tong and make the connection up with a chain tong for 1 to 1 1/2 turns, then proceed with the make-up. If the connection cannot easily be made-up with the chain tong, fully break out the connection, visually inspect for damage, re-stab and proceed with the make-up.

4.5.4 Apply the specified torque to the connection at 3 - 12 RPM. Make up speed should not exceed 14 RPM. Make-up speed should not vary excessively during make-up and should be continuous with no gear changing.

**TARGET MAKE-UP RPM**

2 3/8"	-	12 RPM	8 5/8"	-	7 RPM
2 7/8"	-	12 RPM	9 5/8"	-	6 RPM
3 1/2"	-	12 RPM	9 3/4"	-	5 RPM
4 1/2"	-	12 RPM	9 7/8"	-	4.5 RPM
5"	-	12 RPM	10 3/4"	-	5 RPM
5 1/2"	-	12 RPM	11 3/4"	-	5 RPM
6 5/8"	-	10 RPM	11 7/8"	-	4.5 RPM
7"	-	10 RPM	13 3/8"	-	4.5 RPM
7 5/8"	-	8 RPM	13 5/8"	-	3 RPM
7 3/4"	-	7 RPM			

**NOTE: On CRA materials, do not exceed 8 RPM.**

**NOTE:** If an appreciable amount of thread lubricant is being pushed to the tube ID and/or the tube OD during make-up, too much thread lubricant is being applied to the connection.

**NOTE:** If shoulder torques are high or low, adjust the thread compound application to give good make up torque curves. For high torque, apply more compound and if necessary, apply a light to moderate, even coating of molybdenum disulfide spray to the pin and coupling connectors prior to the application of the thread compound.



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**NOTE: The normal shoulder window is based on dimensional tolerances only. Other factors affecting shoulder torque are texture of phosphate coating, type of thread lubricant used, make-up speeds, temperature, etc.**

**NOTE: The mill make-up should not move appreciably during field make-up. However, a small amount of rotation or less than 1/4" circumferentially is acceptable.**

4.5.5 If the optional torque/turn monitoring equipment is used a make-up torque/turn graph should be generated for every connection.

4.5.6 Lower the elevators over the pipe after make-up is complete, not during make-up.

4.5.7 In the event torque/turn or torque turn/time equipment is used at the rig site, the following procedure should be used to set acceptance criteria:

- a) Prior to the job, the operating company representative should review the Hunting sales data sheet for this connection. Shoulder torque acceptance limits should be in the range shown on Hunting's data sheet.
- b) A torque curve showing a small wave shall be acceptable. However, the connection with a wave in the torque curve exceeding the shouldering torque shall be broken out and visually inspected. If no damage is found, the connection may be made-up again.
- c) A connection with final torque in excess of 80% of the minimum yield torque or delta torque less than 1,000 ft-lb should be broken out and visually inspected. If no damage is found, the connection may be made up again.

4.6 Pulling

4.6.1 Preparation

- a) Slip type elevators are required.
- b) Use an alignment yoke and weight compensator when pulling casing.
- c) Use power tongs with acceptable torque read-out and back-up tongs.
- d) A wooden platform must be used for standing back tubulars. (Refer to API 5C1)
- e) Clean thread protectors should be available prior to laying down or standing back. As each connection is broken out, protectors shall be installed on each pin.

4.6.2 Breaking Out

- a) Use power tongs with torque adjustment adequate for break out without damaging pipe. When coming out of hole, the back-up tong should be placed on the coupling (below centerline) to assure that the pipe joint breaks out at the top of the coupling. Pipe wrenches or chain tongs shall not be used as back-ups.

**NOTE: Prior to break-out, using an ink paint marker, draw a vertical line from the mill make-up side of the coupling onto the mill end tube body. Also draw a line circumferential on the tube body, either side of the vertical line even with the coupling face. If the mill make-up moves more than 1/4" circumferentially during break-out, use these marks to reestablish the mill make-up position.**

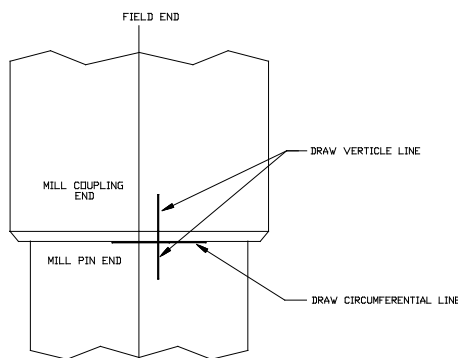




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- b) Break out the connection at a speed less than 10 RPM.
- c) After breaking loose, rotate by hand with the aid of a strap wrench. The connection will be disengaged and ready for separation in 4 1/2 turns from the power tight position.

**NOTE: Do not spin after the connection has “popped.” This can and will cause thread damage and/or galling.**

**NOTE: Some galling occurs during the break-out operation due to misalignment between the broken-out pin and box connectors. Assure the pin and the box are fully aligned prior to attempting to separate the pin and box connectors.**

**NOTE: For CRA material break out initial torque and back out with a strap wrench.**

- d) If excessive torque is noted, rotation should be stopped until cause is determined.
  - e) Great care should be exercised to disengage all of the threads before lifting the casing out of the coupling. Do not jump out of the coupling.
- 4.6.3 Standing Back
- a) Tubulars should be set on a firm wooden platform when stood back in the derrick.
  - b) Protect threads from dirt or damage when the tubulars are out of the hole. Thread protectors should be installed on the pin members when standing back and may be required in the coupling when conditions warrant.
- 4.6.4 Re-Running
- a) Clean connection members fully and inspect for damage.
  - b) Field repair any small protrusion on threads.
  - c) Re-run as per 4.4 and 4.5.
- 4.6.5 Laying Down



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- a) Clean protectors shall be placed on the tubulars before they are laid down.
- b) If tubulars are stored or re-used, remove the protectors after laying down, clean and inspect connections. Coat all exposed threads with water displacing oil (WD-40) followed by Kendex or alternately with other approved thread compound and install clean thread protectors.

**5.0 RUNNING PROCEDURE FOR ACCESSORIES MADE UP USING THREAD LOCKING COMPOUND / LUBRICANT**

- 5.1 Using steam, soap and hot water, or safety solvent, remove all thread storage or running compound from both pin and box connectors.
- 5.2 Ensure that the thread and sealing surfaces are clean, dry, and free of oil, grease, or residues.
- 5.3 On metal-to-metal seal connections, apply the Hunting recommended thread compound to the seal area on both elements (pin and box connectors).
- 5.4 Just prior to make up, the thread locking lubricant shall only be applied on the pin threads (not on the box), on the area that has not been covered by the approved thread compound.
- 5.5 When making up accessories like float equipment, hangers, thick wall accessories, and others, shoulder torques might be higher than normal due to relationship of the friction factors of the thread locking lubricant in comparison with the API Modified thread compounds and the wall thickness.
- 5.6 The make up torque of the accessories should be aimed to the maximum recommended torque. Therefore, if necessary, the published torque may be exceeded but in any case shall not exceed 80% of the published minimum yield torque.