



**RECOMMENDED
PRACTICE
TEC-LOCK FJ**

APPROVED	INITIALS	DATE
Prepared By	RBI	02/24/20
Engineer	SJH	02/25/20
GM QA	ALR	02/25/20
REVISION	001	02/25/20

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 all Hunting **TEC-LOCK FJ** tubing and casing product line connections.

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 Hunting **FLUSH/SEMI FLUSH** tubing or casing connections are run:
- 3.1.1 Ample supply of fresh, unopened thread compound.
 - 3.1.2 Hunting has standardized on Best-O-Life 2000 as the API modified thread compound which is compliant with API 5A3 Annex A. used for connection qualification testing. Using another thread lubricant may substantially change the recommended torque range listed on the sales data sheet.

NOTE 1: For SealLube™ application see “SealLube™ Application Procedure”.

NOTE 2: Due to increased surface area, for sizes larger than 3 1/2”, use LTF 4444; for 3 1/2” and smaller, use HTM 1001.

- 3.1.3 Thread lubricant applicators #58235 moustache brush.

NOTE: Hunting does not recommend a bottlebrush commonly used for thread lubricant application as the amount of lubricant cannot be adequately controlled.

- 3.1.4 Hunting’s field service kit.
- 3.1.5 Appropriate connection data sheet.
- 3.1.6 **VISUAL THREAD INSPECTION**, Ancillary Specification.
- 3.1.7 **STEEL IMPERFECTIONS**, Ancillary Specification.
- 3.1.8 **OPTIONAL** - Molybdenum disulfide spray.
- 3.1.9 **OPTIONAL** - WD-40.
- 3.1.10 **OPTIONAL** - Torque turn monitoring equipment.
- 3.1.11 Appropriate size and weight handling plug.
- 3.1.12 Appropriate size and weight stabbing guide.
- 3.1.13 Appropriate size single joint elevators.
- 3.1.14 Power tongs with torque capacity 30% above make up torque or anticipated operating torque should be supplied, as break out torques could be substantially higher.

NOTE: Running operations involving rotating or pulling the casing string can increase the amount of torque stored in the connection. Running operations should be considered when selecting the torque capacity for the make up/ break out equipment.

- 3.1.15 Tong Jaws with the ability to evenly contact a majority of the pipe OD are recommended.



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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 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.
- 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 without liftable protectors. When liftable protectors are not available, handle with nylon slings only.

4.2 Preparation

- 4.2.1 Ensure that all necessary running equipment is available and in good condition.

NOTE: Following a thorough review of running/accessory equipment, discuss running procedures with Drilling Supervisor.

- 4.2.2 **HYC type elevators of proper size, in good repair and with the setting plate adjusted properly, setting plate length should be a min. 10" in length.**

NOTE 1: Hunting does not recommend the use of bottleneck or shoulder type elevators.

NOTE 2: Use power tongs with capacity 30% above make up or anticipated operating torque.

- 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.

NOTE: The safety clamp should be used above the table slips up to a string weight of 20 tons (40,000 pounds).

- 4.2.5 Check for traveling block alignment and rotary hole alignment.

NOTE: Without the stabbing guide in place on the box connector, the driller shall 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.

- 4.2.6 Ensure that an ample supply of thread compound is available. Only fresh, previously unopened containers of compound shall be used. Stir thoroughly.

NOTE: See Section 3.1.1 for recommended thread compounds.



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

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 and box ends. Clean each connection and pin protectors thoroughly. Pre-install handling plugs in the first joints to be run and reinstall pin protectors (dry).
 - 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: Care must be taken to ensure that the cleaning process does not cause environmental pollution.

- 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.

NOTE: 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 or threads when placing the mandrel in the joint.
- 4.3.5 Inspect the threaded connections using Hunting's **VISUAL THREAD INSPECTION** guidelines and **ANCILLARY SPECIFICATIONS**.

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 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.

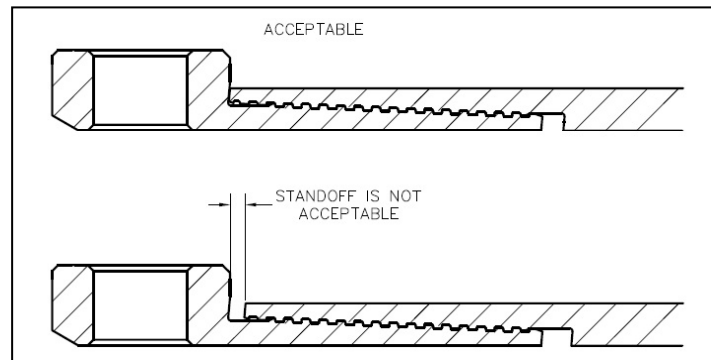
- 4.4 Running
 - 4.4.1 Handling plugs and/or thread protectors must be in place whenever tubulars are moved. Handling plugs shall be installed prior to rolling joint onto skate or any other movement on the rig, so as to not damage box connection.
 - 4.4.2 Joints should be moved to the V-door via a pick-up 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.

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4.4.3 Elevators or pick-up line with or without single joint elevators may be used to lift the joint up in the derrick. The single joint elevators shall be bored to pipe O.D. + 0.030" + 0.050" and a minimum yield of 110 KSI, for the appropriate size and weight to be run.



WARNING: Prior to lifting TEC-LOCK FJ lift plugs must be shouldered with the external box shoulder. Failure to do so may cause the lift plug to disengage, which may result in the pipe falling. This may cause connection damage, property damage, bodily injury or loss of life.

NOTE 1: Do not remove handling plug from box until mud line is removed after filling.

NOTE 2: Stabbing guide shall be installed prior to the make up of any connection regardless of the equipment used.

4.4.4 If Casing Running Tool (CRT) is to be used, remove the thread protector and replace it with a Hunting internal tool guide / handling plug.

NOTE 1: If CRT is used for make up no dump valve shall be used and a 5 - 8 second torque hold shall be applied.

NOTE 2: If a CRT is used and the connection is being made up with the top drive, insure that the torque registered at the floor is consistent with the torque being applied at the top drive.

NOTE 3: When running with a CRT Hunting Recommends the use of a compensator.

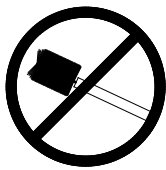
NOTE 4: Hunting connections are not interchangeable with any other connections in the industry. The use of an internal tool guide / handling plug different than the ones designed by Hunting Energy Services for specific connections or applications may result in property damage, injury, or death. Hunting will not be held accountable nor accept any liability if the proper equipment is not utilized for its intended purpose.

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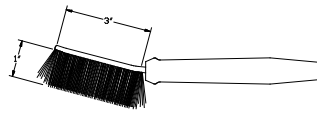
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- 4.4.5 Clean and re-inspect each connection as it hangs in the derrick. Remove any thread compound, drilling mud or solvent or moisture remaining on the connection after removing the protector and/or handling plug.
- 4.4.6 After the connection is clean and dry, apply a light, even coating of the thread compound to the pin and box connectors.

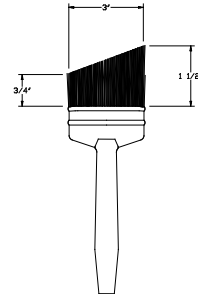


Do Not Use
Bottle Brush



#58235

Preferred Moustache Brush #58235



Alternate Acceptable
Modified Paint Brush

NOTE: A light, even coating of thread compound is defined as all thread surfaces, root and crest, and pin face/torque shoulder covered with an even coat of thread compound. However, the thread form should remain clearly visible.

- 4.4.7 Use an alignment yoke to assist make up.
- 4.4.8 Stab the pin connector into the box connector utilizing the appropriate size and weight stabbing guide.
- 4.4.9 If the connection is mis-stabbed, pick up the joint, clean the pin and the box and reinspect.
- 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 should be utilized when available. An enhanced computer display should be part of the torque-turn monitoring equipment and should be 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 box connection. (Refer to Reference 1 below). Use back-up tongs for the first 10 joints or until enough weight is generated in the slips to prevent the entire string from rotating.**

NOTE 1: It is recommended to use a proper Jaw / insert size with enough contact area with the pipe to minimize the insert marks.

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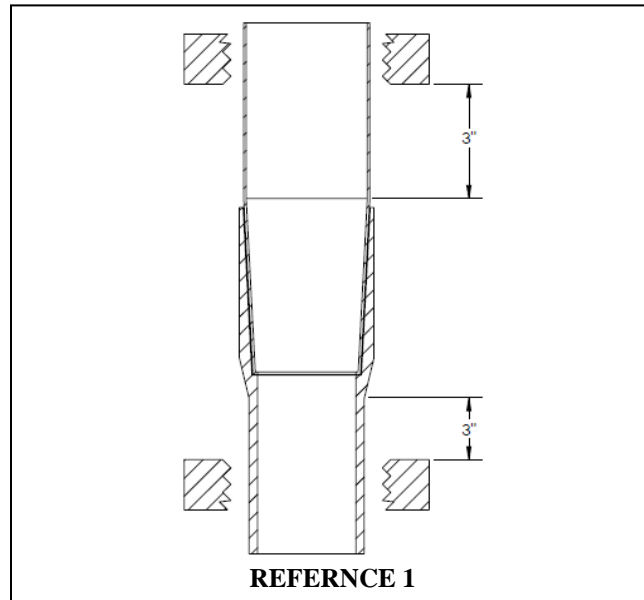
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NOTE 2: The maximum acceptable insert mark depth on Carbon steel pipe is 12.5% of the pipe wall thickness and 5% or 0.012" on sour service and CRA Material.

NOTE 3: Insert marks are NOT allowed over the TL FJ Box connection. It is highly recommended to avoid gripping over the TL FJ Box transition area as this will lead to uneven deep insert marks. Refer to NOTE 2 for acceptance criteria.

NOTE 4: The below Reference 1 shows the location of Tong Jaws during make up of the Tec-Lock FJ connections.



NOTE 5: Power and backup tong inserts shall be clean and not worn. Tong inserts should not leave marks exceeding 12.5% of the pipe wall thickness for carbon steel and 5% or 0.012" on sour service or CRA material. Excessive or sharp-bottomed marks must be removed. Mark removal may be by filing only.

NOTE 6: It is recommended that Tong Jaws have the ability to evenly wrap around the majority of the OD

4.5.3 Position the power tongs approximately 3" above the pin connector. Position back-up tongs 3" below the box connector. (Refer to 4.5.2 NOTE 4.)

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



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4.5.4 Make up in high gear is allowed from stabbing to hand tight. It is recommended to not exceed 20 RPM in high gear. Make up speed should not vary excessively and should be continuous with no gear changing after the snub line becomes tight. Make up the connection power-tight using the make up speeds specified in the accompanying chart. In no case should the make up speed exceed 5 RPM after the hand tight / snub line becomes tight

NOTE 1: If shoulder torques are high or low, adjust the thread compound application to give good make up torque curves. Over doping TEC-LOCK FJ increases the shoulder torque value. For very high torque, apply Molybdenum disulfide to both pin and box connectors prior to the application of the thread compound.

NOTE 2: Hunting running specifications state that the connection must shoulder prior to reaching maximum shoulder torque.

NOTE 3: The normal shoulder window is based on dimensional tolerances only. Other factors affecting shoulder torque are texture of phosphate coating, type of thread lubricant, make up speeds, temperature, etc.

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 connection data sheet for this connection. Shoulder torque acceptance limits should be in the range shown on Hunting's optimum torque/turn graph.
- b) Those connections falling outside the acceptable shoulder torque values should be broken out and checked for damage. If no damage is found, the connection may be made up again. Adjust doping procedures as suggested in Section 4.5.4 NOTE to achieve higher or lower shouldering torque as necessary.
- c) 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.
- d) Final torque in excess of the maximum acceptable final torque or less than the minimum acceptable final torque, the connection should be broken out and visually inspected. If no damage is found, the connection may be made up again.

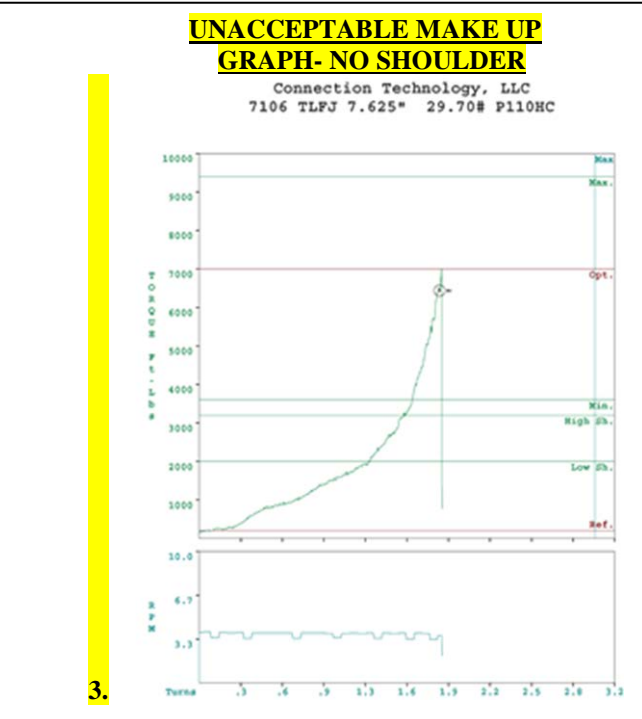
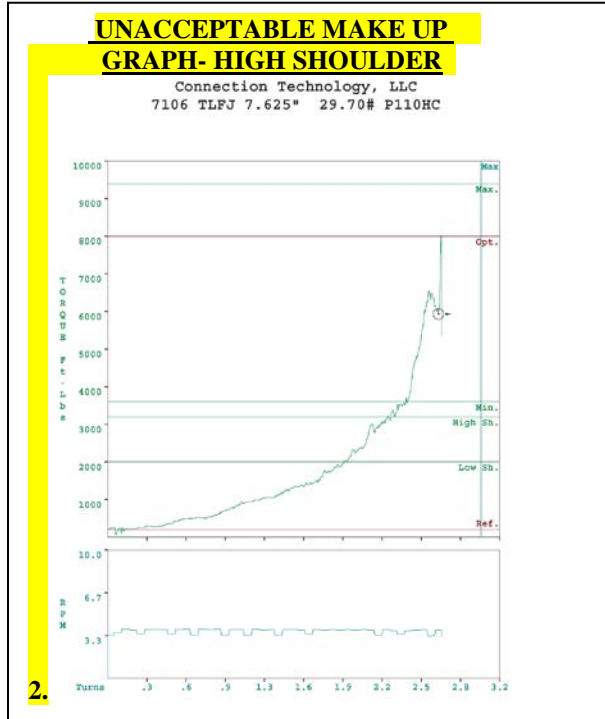
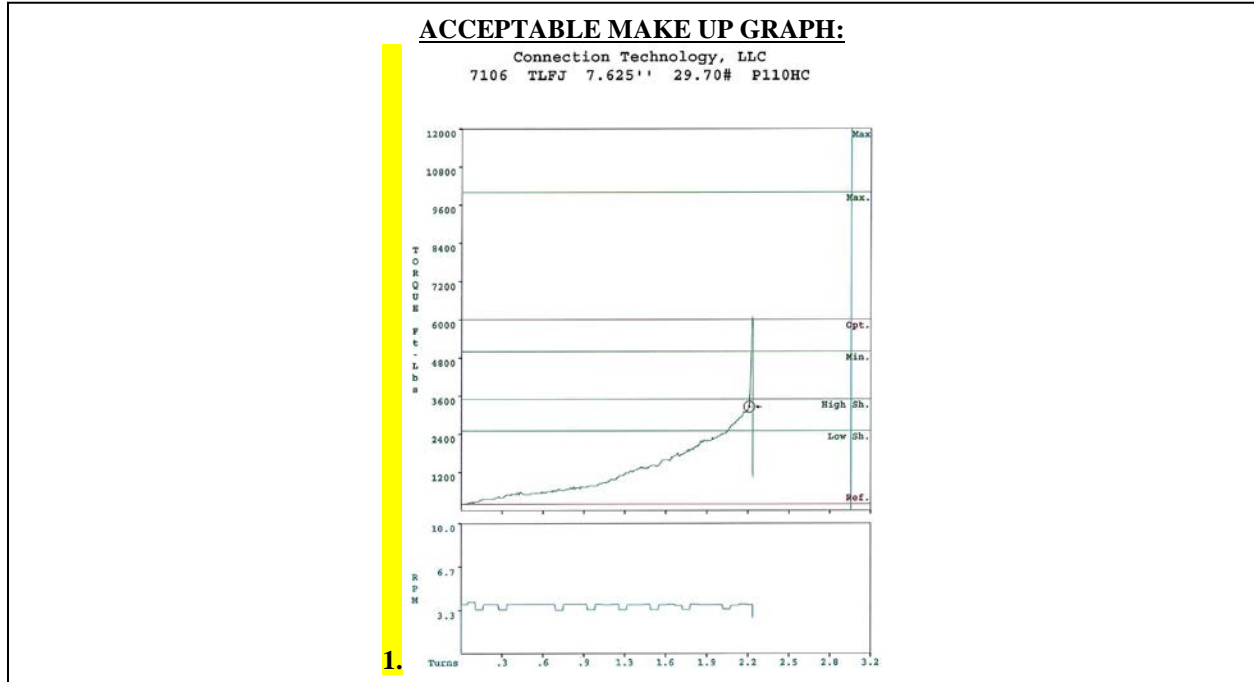


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NOTE: See following examples of acceptable and unacceptable make up graphs.





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4.6 Pulling

4.6.1 Preparation

- a) Slip type elevators with setting plate length should be a min. 10" in length, is 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 tubing. (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.
- f) The connection may require significantly more break out torque when compared to make up torque. Operations beyond normal make up conditions and the amount of time the string has been sitting in the well are factors that could cause higher break out torques. These conditions are inclusive of, but not limited to rotating, reciprocating, jarring, well temperature and applying weight to the casing string.

NOTE 1: Safety clamps and handling plugs must be used during pulling.

NOTE 2: Prior to separation a stabbing must be in place.

4.6.2 Breaking Out

- a) During pulling operations, the back-up tong should be placed on the pipe below the connection. (Reference Notes in Section 4.5.2) Pipe wrenches or chain tongs shall not be used as back-ups.
- b) Break out the connection at a speed less than 5 RPM.
- c) After breaking the connection continue to rotate at 5 RPM or less until the connection drops down one thread. Remove the power tongs and slowly pick up the joint. The connection will be disengaged and ready for separation in 7 turns from the power tight position.

NOTE: Do not spin after the connection has "dropped." This can and will cause thread damage and/or galling.

- d) If excessive torque is noted, rotation should be stopped until cause is determined.
- e) Ensure all of the threads are disengaged before lifting the tubing/casing out of the box. Do not jump out of the box. If this occurs, inspect the pin face and threads for damage.

4.6.3 Standing Back (Tubing)

- 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 shall be installed on the pin members when standing back and may be required in the box when conditions warrant.

4.6.4 Re-Running

- a) Clean connection members fully and inspect for damage.
- b) Re-run as per 4.4 and 4.5.

4.6.5 Laying Down (Casing)

- a) Clean protectors shall be placed on the tubulars before they are laid down.



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- 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 other acceptable storage 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 is clean, dry, and free of oil, grease, or residues.
- 5.3 On thread sealing connections, apply the Hunting recommended thread compound on the first three (3) thread of the pin and last three (3) threads of the box (area of the perfect threads engagement).
- 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.