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## **SCOPE**

The following outlines the recommended practices for field handling, running, and pulling of tubular products with Benoit® Flush & Semi-Flush Connections and is intended to assist the user in the proper installation of these connections. It is understood that actual procedures may vary depending on weather conditions, availability of equipment, and personnel. In any case, proper planning and careful execution are vital to a successful outcome.

## **SPECIAL ALLOY**

Special alloy tubing, such as those with Chrome (Cr) content greater than 9% and Nickel (Ni) based alloys, are much more susceptible to damages than carbon steel tubing. The following additional practices should be incorporated with their use:


- Prior to handling/lifting special alloy tubulars, all personnel involved should be briefed on the delicate nature of the product and how their duties should be conducted.
- Pipe racks should be coated with a non-metallic material.
- The use of a properly adjusted weight-compensator is strongly recommended during running and pulling of special alloy tubing.
- All movement should be closely monitored to avoid excessive metal-to-metal contact. No movement should take place without pin and box thread protectors in place.
- Prior to application of thread running compound, both the pin and box should be uniformly coated with dry moly spray lubricant and allowed to thoroughly dry.

## **INTERNAL PLASTIC COATING**

Tubulars with internal plastic coating, (IPC), are much more susceptible to damages than non-coated carbon steel tubing. The following additional practices should be incorporated with their use:

*NOTE: IPC drift dimensions are different than API drift dimensions and are based on the coating type and coating thickness.*

- Prior to handling/lifting IPC tubulars, all personnel involved should be briefed on the delicate nature of the product and how their duties should be conducted.
- All movement should be closely monitored to avoid excessive metal-to-metal contact. Excessive metal-to-metal contact could potentially crack or damage the internal coating. No movement should take place without pin and box thread protectors in place.

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## **PRE-RUNNING PREPARATION**

### ***Tubing Preparation***

1. While tubing is on the storage rack, remove the pin and box protectors on only one row at a time.
2. If a drift test is to be performed, it should be done prior to cleaning and inspection of connections. Inspect the drift mandrel to ensure that it conforms to API requirements. Drift from the box end toward the pin end. Be very careful not to damage the connections during drifting. Items that do not pass the drift test should be clearly marked and segregated for further investigation.
3. Thoroughly clean and dry the connections. For final cleaning, Benoit® recommends the use of a hot water pressure washer, steam cleaner, or solvents which leave no residual film (no diesel).
4. Visually inspect the connections for any damage. Any damages that can be field repaired should be done at this time. Joints with connections that cannot be field repaired should be marked accordingly and segregated to avoid unintended use.
5. Records should be kept on all repairs and rejects.
6. Inspect the tubing ID for dirt or scale, and if present, remove with compressed air. Blow out tubing from the box end toward the pin. If the tubing has internal plastic coating (IPC), verify that the coating is not chipped or damaged. A thin layer of coating may be present in the PR groove, but must not extend into the seal or thread areas of the connection
7. If Protective Rings, (PR) are to be installed it should be done at this time. Special installation tools are available for purchase or rental from Benoit. Do not install PR rings if the groove is not clean and free of thread compound or other contaminants. The ring should not protrude into the ID of the connection after proper installation.

### **BEN-EUI CONNECTION W/ “PR”**

8. **For IPC coated pipe with “PR” feature, using a “moustache” brush, apply a light even coat of thread compound to the PIN only, including the pin face. Apply enough compound to evenly lubricate the threads and seals but do not allow large amounts to accumulate in the connection shoulders or fill more than 1/3 of the thread height (approximately 10 -12 grams). Boxes with “PR” feature should have “Dry Moly” only applied and allowed to dry prior to installing protectors wrench tight.**  
On special alloy material, apply dry moly lubricant to both pin and box prior to application of the thread compound.
9. For non IPC coated pipe, using a “moustache” type brush, apply a light even coat of thread compound to the pin and box. Apply enough compound to evenly lubricate the threads and seals but do not allow large amounts to accumulate in the

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connection shoulders or fill more than 1/3 of the thread height (approximately 10 -12 grams). On special alloy material, apply dry moly lubricant to both pin and box prior to application of the thread compound.

*NOTE: Benoit® has standardized on BOL-72733 thread running compound for premium connection qualification testing. Reference APPENDIX B regarding the use of alternative running compounds.*


10. Install clean, dry pin and box thread protectors prior to moving the tubing.

### ***Running and Handling/Lifting Equipment***

1. Check the traveling block and rotary for proper vertical alignment.
2. Ensure that the slips are in good working condition, are fitted with the proper dies, and will accommodate the weight of the string.
3. Locking slip-type elevators are recommended on **flush** and **semi-flush** connections. Standard slip-type elevators are not recommended due to the potential for “crushing” the box connection. If an approved “Double Setting Plate” is used on the elevator, the lift plug must be rated for the string weight being run. Benoit does not recommend the use of bottleneck or shoulder type elevators.

*NOTE: Do not use handling plugs in conjunction with a “Double Setting Plate” as handling plugs are not rated for string weight.*

4. Verify that the elevators are directly centered over the rotary hole when hanging from the traveling block.
5. The power tongs should be rated for the torque that is to be applied. Integral hydraulic backups are recommended. Both tongs and backups should be fitted with the proper sized dies and the dies must conform to the curvature of the tubing. If power tongs are not fitted with integral backups, the snub line must be at a 90-degree angle to the tongs and must be level. Verify that load cells are currently calibrated, within the last 6 months. Verify calibration records are on location.
6. A man on the stabbing board or yoke should be utilized to maintain vertical alignment throughout stabbing and makeup/breakout.
7. Handling/lifting plugs should be utilized for connection protection and personnel safety. Inspect the plugs for overall condition and for proper fit. If damages are present, such as galled or torn threads, the plug should be repaired or replaced. Benoit® handling/lifting plugs should be manufactured such that there is no internal seal contact when mated into the box.

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*NOTE: Handling plugs are not designed to carry string weight.*

8. Lift plugs should be utilized for flush and semi-flush connections. Verify the capacity of all lift plugs prior to use and that the string weight is less than the rating of the lift plug.
9. A stabbing guide should always be used when stabbing the pin into the box. It should be in good working order and provide adequate connection protection.
10. Clean, fresh thread compound should be on location in sufficient quantities. The compound must be kept covered between uses to prevent debris and moisture from entering the container.
11. A safety clamp in good working condition and sized for the tubing and accessories should be available.
12. Verify that the correct size drift/rabbits are available.


*NOTE: UHMW or Teflon drifts/rabbits must be used for CRA and IPC tubulars.*

13. If a pickup/laydown unit is to be used, the pickup arms, trough and backstop should be coated with rubber or other soft material. The use of nylon slings is acceptable.

### ***Tubular Accessories***

*NOTE: It is preferable to make in-string accessories up into assemblies, with pup joints on top and bottom, prior to deliver to location. This can be performed at Benoit's fully equipped torque & test facility. Each connection in the assembly is computer torqued with generation of a torque graph. After assembly, full-length drift and pressure testing, with water and/or gas, may be performed. This will virtually eliminate rig down time and connection damage from problems associated with different diameters and accessory lengths.*

1. All accessories that are to be part of the tubing string should be located and checked for compatibility with the string design.
2. If any accessories are not present, or do not conform to the string design, the appropriate end-user representative should be notified.
3. Any accessories that are similar, yet slightly different, should be clearly marked to indicate the position that they will be located in the tubing string.
4. If possible, all accessories should be drifted. Accessories with restricted IDs may also be drifted if prior arrangements have been made to have reduced size drift mandrels present.
5. Note if any accessories will require additional makeup or handling/lifting equipment and verify availability on location.

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6. Thoroughly clean and dry all accessory connections.
7. Visually inspect the connections for damages. Any damages that can be field repaired should be done at this time.
8. Accessories with connections that cannot be field repaired should be marked accordingly and segregated to avoid unintended use. The end-user representative should be notified to ensure that replacement accessories are available for the tubing run.
9. If Protective Rings (PR) are to be installed it should be done at this time.
10. Clean, dry thread protectors should be placed back on all connections.

## **RUNNING AND PULLING**


### ***Running***

1. Ensure that thread protectors are in place and transport joints to the V-door using a pickup unit or a nylon strap attached to the box-end.
2. Remove the box protector from the joint in V-door that will be lifted for makeup.
3. Install a clean handling/lifting plug to the box connection. This will minimize the possibility of connection damage and reduce the chance of the pipe slipping through the pickup line. The handling/lifting plug should be wiped clean and visually inspected prior to each use.
4. Lift plugs must be installed and tightened with a make-up bar prior to hoisting the joint to vertical.

*NOTE: Failure to make up the lift plug securely with the make-up bar may cause the lift plug to disengage, which could result in the joint falling. This may cause connection damage, property damage, bodily injury or loss of life.*

5. If the tubing is to be rabbited, the rabbit should be placed in the tubing after installation of the handling/lifting plug. Ensure that the rabbit is clean and dry before inserting into tubing.
6. A single-joint elevator, (SJE) or a pickup line may be used to lift the joint up into the derrick. The joint should be raised at a moderate speed for both safety and protection of the tubing. A swivel is recommended in the system if using an SJE configuration.
7. Remove the pin protector and rabbit from the joint hanging in the derrick. Redistribute the thread compound on the pin connection if needed. If any debris is present, the pin should be wiped clean and thin even coating of fresh thread compound applied.
8. Remove the handling/lifting plug from the box connection on the joint in the rotary.  
For BEN-EUI W/ "PR", "Dry Moly" may be re-applied. **Do not apply thread compound to the BEN-EUI "PR" box.**



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9. Place the stabbing guide onto the box connection.
10. The upper joint must be in true vertical alignment over the box of the joint in the rotary and must be in complete control before stabbing. Do not rock the pipe to stab.
11. Very slowly, lower the joint hanging in the derrick. Carefully stab the pin into the box connection. If the connection is mis-stabbed, lift the joint, wipe the connections, and visually inspect for damages.
12. Remove the stabbing guide from the box connection.
13. Makeup the pin into the box by hand or, if necessary, with a strap wrench with a smooth even motion, until the hand make-up stops at the stand-off position, usually 1 – 2 turns before shouldering. Do not force the joint to turn if excess resistance is encountered. This may indicate misalignment and could lead to galling.
14. Position the power tongs on the pipe such that the tongs and backups are sufficiently above and below the connections. Makeup the connections within the recommended torque range at **no more than 5 RPM**. If premature torque is noted, stop rotation immediately and verify vertical alignment. If premature torque is still present, back-out the connections and inspect for damages before proceeding.

*NOTE: Reference APPENDIX A for torque graph acceptance criteria.*

15. After full torque has been achieved, remove the power tongs, latch the elevators onto the tubing string, and raise the traveling block at a slow speed. If the block is raised too rapidly, stretching and/or necking of the tubing may occur.
16. Pull the slips and lower the tubing string into the hole. When the string is in position for the next makeup, stop the downward movement and set the slips around the tubing. Gently set the string weight on the slips. Applying weight too rapidly may cause the tubing to stretch and/or neck-down in the slips.
17. Unlatch the elevators from the joint in the rotary. Hold the elevators far enough away from the joint to avoid contact and repeat steps 2 through 17.

### ***Pulling***


1. Install a handling/lifting plug into the box, tighten accordingly with the make-up bar, into the joint in the rotary and gently position & latch the elevators around the joint. Raise the block at a slow and even speed.
2. When the string is in position for connection breakout, stop the movement and set the slips in the rotary. Gently set the weight of the tubing string on the slips.

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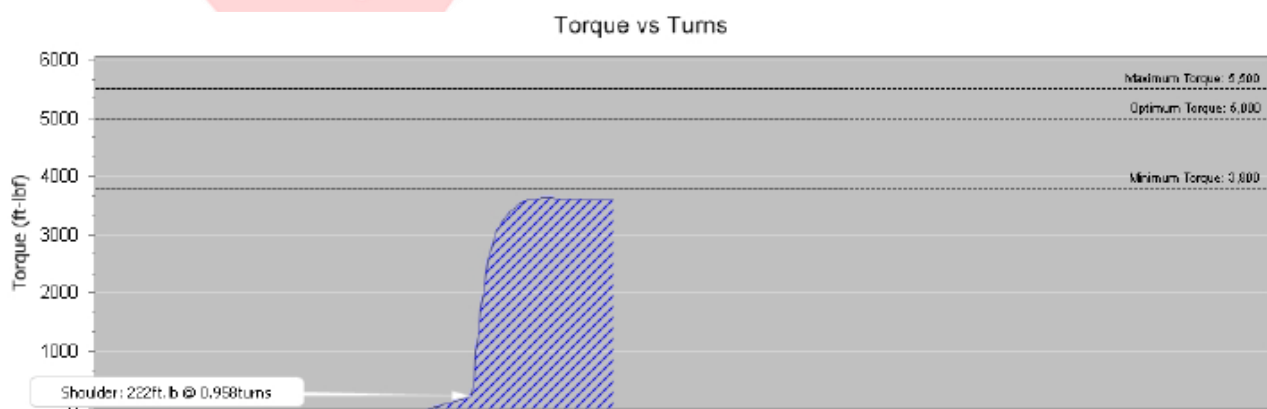
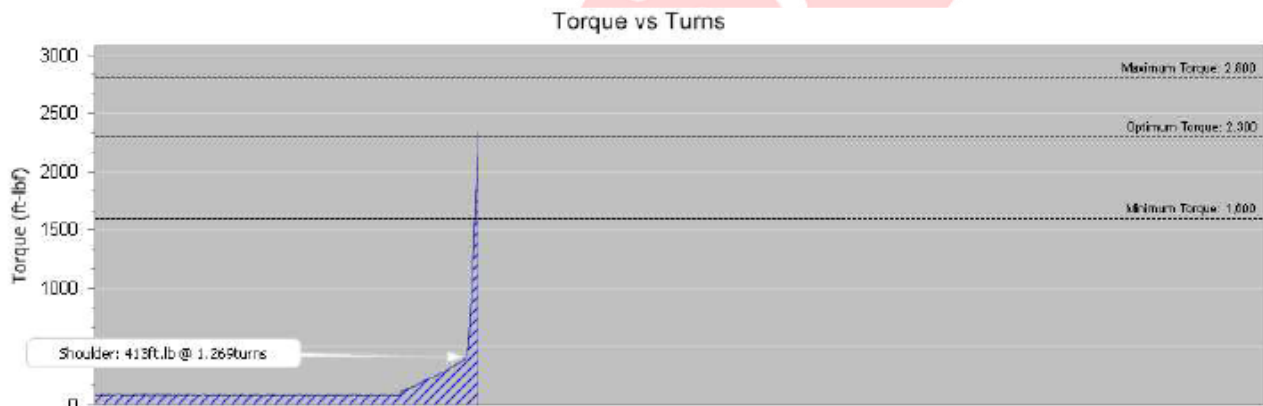
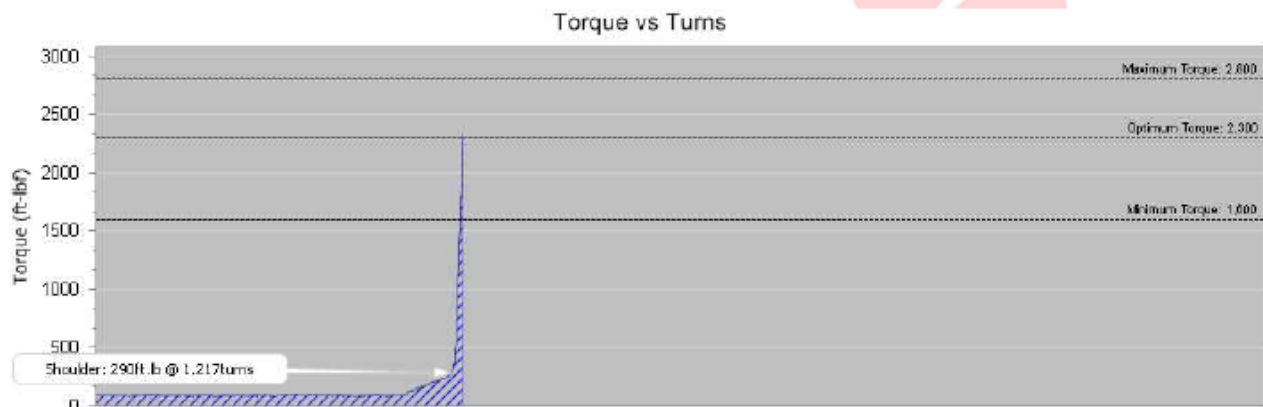
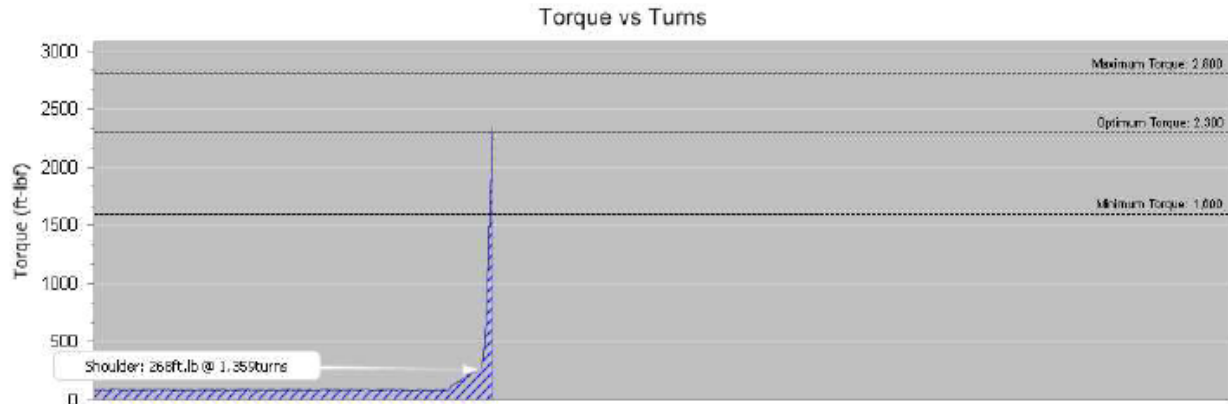
3. Unlatch the elevators and raise them above the joint to be backed out.
4. Have personnel on the stabbing board hold the joint to be backed out as close to true vertical as possible. The use of a weight compensator is strongly recommended during pulling operations.
5. Position the power tongs on the pipe such that the tongs and backups are sufficiently above and below the connections. Breakout the connections in low gear at **no more than 5 RPM**. Do not breakout with connections in tension. Continue rotation until the pin “hops” once, then immediately stop rotation.

*NOTE: For connections on special alloy material: After initial break, rotate the connection approximately 1/4 turn, unlatch the power tongs and continue break-out by hand or with a strap wrench until the connection "hops" once. Stop rotation if excess resistance is felt and check for vertical alignment.*


6. Attach the pickup line or SJE to the joint in the derrick.
7. Place the stabbing guide onto the box of the joint in the rotary to reduce the chance of jump-out damage.
8. Gently raise the traveling block to lift the joint. If the connection does not appear to be free, turn it counter clockwise one-half turn and try to lift again.
9. Apply fresh compound to the pin connection and install a clean thread protector.
10. Lower the joint into the V-door, remove the pickup line or SJE, and remove the handling/lifting plug from the box connection.
11. Apply fresh compound to the box connection and install a clean thread protector.
12. As soon as possible after pulling tubing out of the well, it should be thoroughly cleaned using fresh water and a high-pressure washer to remove contamination of completion fluids from the OD, ID, and connections.
13. Dry the connections and pipe ID using compressed air. Coat the connections with storage compound and install clean, dry thread protectors.

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## APPENDIX A – TORQUE GRAPH ACCEPTANCE CRITERIA





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## APPENDIX B – RECOMMENDED THREAD COMPOUNDS

The following recommendations are the result of numerous make and break tests on BTS® connections using various thread compounds. *These recommendations are not intended to endorse or promote any particular thread running product or company and will be updated as better running compounds are discovered.*

<b>FOR ALL CARBON GRADE TUBING:</b>	
<b>API Modified</b>	Bestolife 72733 Jet-Lube API Modified OCR 300 – API Modified
<b>Environmentally Safe (In order of preference)</b>	Bestolife PTC and PTC-ST Jet-Lube Seal Guard Jet-Lube Enviro-Safe

<b>FOR 13CR-80, 13CR-85, and 13CR-95 GRADE TUBING:</b>	
<b>API Modified</b>	Bestolife 72733 Jet-Lube API Modified OCR 300 – API Modified
<b>Environmentally Safe (In order of preference)</b>	OCR Liquid-O-Ring 167ML50 Bestolife PTC and PTC-ST Jet-Lube Seal Guard

<b>FOR HYPER AND SUPER 13CR-110 GRADE TUBING:</b>	
<b>API Modified</b>	Bestolife 72733 Jet-Lube API Modified OCR 300 – API Modified
<b>Environmentally Safe (In order of preference)</b>	OCR Liquid-O-Ring 167ML50

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For all 13CR material, prior to application of the thread running compound, Benoit® recommends that a uniform coating of dry moly be sprayed onto the pin and box connections and allowed to dry.

BTS®, Flush & Semi-Flush Connection performance properties, as well as Benoit's Recommended Running Procedure for BTS® connections, can be found on our website at [www.benoit-inc.com](http://www.benoit-inc.com) or by calling (985) 879-2487 to obtain a copy by fax or mail.

Bestolife Corp.	1-855-243-9164	<a href="http://www.bestolife.com">www.bestolife.com</a>
Oil Center Research	1-800-256-8977	<a href="http://www.oilcenter.com">www.oilcenter.com</a>
Jet-Lube, Inc.	1-800-538-5823	<a href="http://www.jetlube.com">www.jetlube.com</a>