

TenarisHydril ER™ Connection

Scope

These guidelines apply specifically to the use of TenarisHydril ER™ (Easy Running) connections. This document should be used in conjunction with the TenarisHydril Running Manual, which is the main document applicable to the running of all TenarisHydril premium connections.

References

- TenarisHydril Running Manual.
- Premium Connection Approved Thread Compounds TSH-MD-00.0002.
- Recommended guidelines for the field inspection of TenarisHydril connections, FSOG 13-005.

Equipment, Material & Documents

1. Verify the appropriate thread compound is available.
2. Refer to document TSH-MD-00.0002 for a list of compounds approved by Tenaris.
3. Latest version of the specific Product Data Sheet can be obtained from the Tenaris web site. In case this is unavailable, request the data sheet from the local Technical Sales representative or contact-tenarishydril@tenaris.com.

Pre-Running

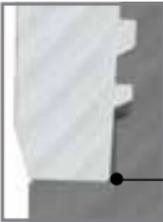
1. Never move or handle pipe without the correct thread protectors securely in place
2. Ensure connections are cleaned and free of all debris and / or contaminants, cleaning methods employed should conform to the recommendations contained within the TenarisHydril Running Manual.
3. Verify all pipe and accessories have genuine TenarisHydril manufactured connections.
4. Visually inspect threads and torque shoulder prior to running, ensuring no damage is evident.
5. On Dopeless® connections, check condition of both pin and box coating ensuring no peel off or degradation has occurred.
6. Verify the compatibility of the ER™ connection with any accessories such as, cement heads, safety valves, cross overs, etc.
7. Verify material grade of all accessories ensuring compatibility with main string.

Inspection

1. Inspection criteria for all TenarisHydril connections is as outlined in the Field Service Operative Guideline FSOG 13-005.
2. Ensure the pin and box torque shoulders have no dents, tears or raised material which could interfere with correct assembly.

ER™ Configuration

7" > 13 5/8" = 4 TPI
14" > 24 1/2" = 3 TPI
No Metal to Metal seal



TORQUE
SHOULDER

Thread Compound Application



1. Apply a thin coating of thread compound on the pin and box connections, fully covering all threads, pin nose and box torque shoulder, the thread form should be fully visible.
2. Use approximately 50% of the quantity applied to the pin when doping the box.
3. For Tenaris approved thread compounds, apply the friction factor indicated in TSH-MD-00.0002. For thread compounds other than those listed, apply the thread compound manufacturers indicated friction factor.

Thread Lock Application



Connections must be clean and dry when applying thread lock.

1. Apply a thin coating of thread lock on 50% of the pin threads furthest from the pipe body.
2. Do not apply thread lock on the torque shoulder.
3. Apply thread compound to the box torque shoulder.
4. Apply the thread lock manufacturers indicated friction factor.

ER™ Dopeless®



1. Minor rust or discolouring of the pin connection can be removed with the use of a clean, dry rag ensuring the Dopeless® coating remains intact.
2. Minor rust or discolouring of the box connection can be removed with the use of a non abrasive plastic scouring pad and a clean, dry rag ensuring the Dopeless® coating remains intact.
3. Dopeless® connections do not require the application of thread compound for make up.
4. If for whatever reason thread compound has to be applied to ER™ Dopeless® connections, whether both pin and box are Dopeless® or when mixing a doped connection with Dopeless®, apply thread compound as indicated below.

NON DOPELESS® PIN INTO DOPELESS® BOX

- Apply a thin coating of thread compound on all pin threads and pin nose.
- Apply a thin coat of thread compound to box torque shoulder.

DOPELESS® PIN INTO STANDARD BOX

- Apply a very thin coating of thread compound on all pin threads only.
- Do not dope box connection.

DOPELESS® PIN INTO DOPELESS® BOX

- Apply a very thin layer of thread compound on all pin threads only.
- Do not dope box connection.

| | DOPELESS® PIN | STANDARD PIN |
|---------------|-----------------------|---|
| Standard Box | Dope Pin Threads Only | See page 4 |
| Dopeless® Box | Dope Pin Threads Only | Dope Pin Thread & Shoulder. Dope Box shoulder. |

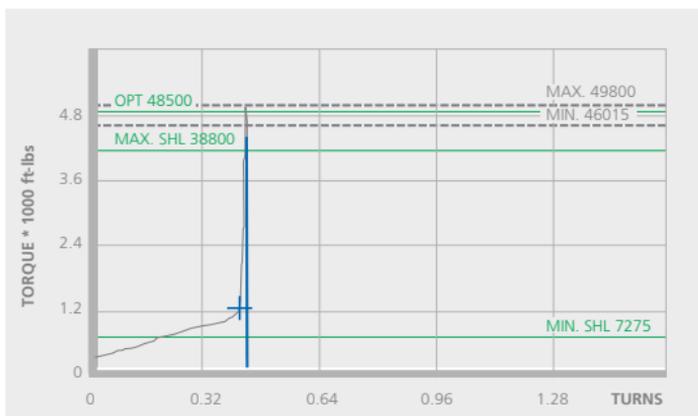
If applying thread compound to Dopeless® connections use the doped variant torque values.

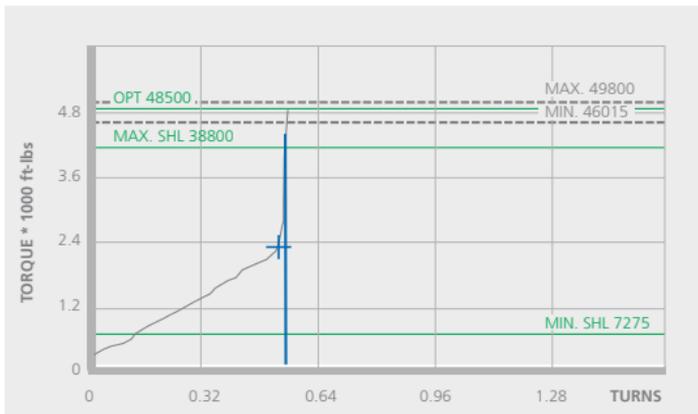
ER™ Dopeless® Thread Lock

1. Ideally when running a Dopeless® string the connections to be thread locked should be the non Dopeless® variant with the connections cleaned of thread compound and completely dried, then thread lock and dope applied as per page 5.
2. When thread locking Dopeless® connections remove the Dopeless® coating from the threads on the pin connection where the thread lock is to be applied prior to the application of thread lock.
3. Leave the Dopeless® coating on the torque shoulder and threads where no thread lock is to be applied.
4. Dopeless® boxes should be washed with hot water then dried prior to thread locking.
5. Thread lock should be applied to 50% of the pin threads immediately behind the pin nose, as per the diagram on page 5.
6. The application of thread dope is not required.
7. When assembling Dopeless® connections with thread lock, apply the non Dopeless® torque values taken from the standard product data sheet.
8. Apply the thread lock manufacturers indicated friction factor.

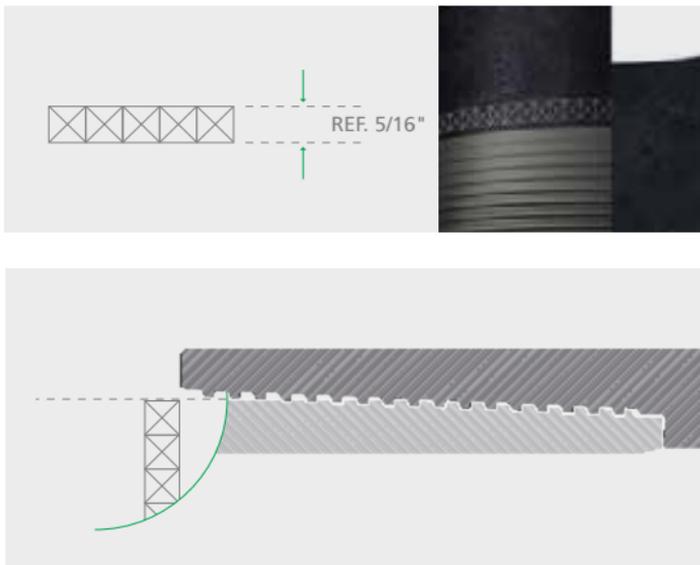
Torque Application

1. The use of computer make up analysis equipment is strongly recommended when assembling ER™ connections.
2. Shoulder points for ER™ connections.
 - Minimum 15% of optimum.
 - Maximum 80% of optimum.
3. Reference torque should initially be set at 5% of optimum.
4. The dump valve should be set at optimum, verify correct operation on the pipe body prior to first make up.
5. Set the computer turns to 2 initially then adjust as necessary to attain good graph depiction.
6. Refer to the TenarisHydril running manual make up acceptance section for further explanation.
7. The computer make up profile for ER™ connections should be similar to the ones below.





8. If different weight or grade of connections are to be mixed apply the lower of the indicated make up torques.
9. When assembling ER™ Dopeless® connections the torques applied must be taken from the Dopeless® variant product data sheet.
10. When mixing standard doped and Dopeless® connections apply doped variant torque values.
11. ER™ pipe $\geq 13 \frac{3}{8}$ " should have a make up loss (MUL) indicator stamped around the circumference of the pin OD. This MUL indicator is to assist in the visual verification of correct assembly and eradicates the necessity of applying the MUL by hand, however this does not replace the requirement for a good make up graph as the primary acceptance / rejection criteria for connection assembly.
12. After make up the face of the coupling should finish at the lower edge of the make up band (edge closer to the pin nose).



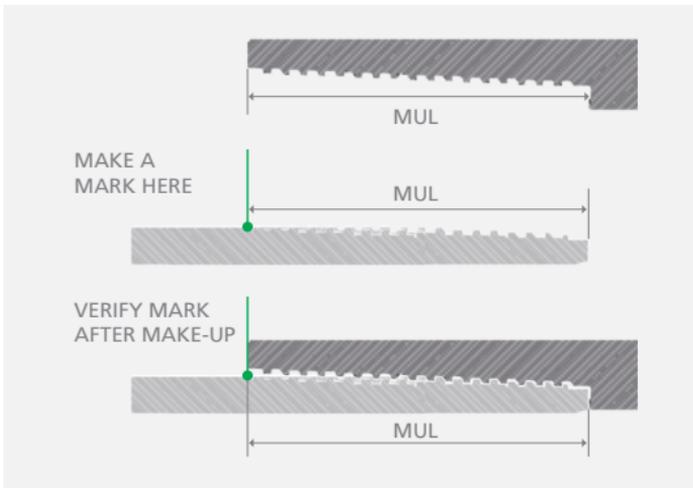
13. The make up band may be located within the thread run out area and may be of a different configuration to the one indicated above. The distance from the pipe end to the make up band should always be checked in order to verify it corresponds to the MUL indicated on the latest product data sheet.

14. For ease of identification after make up it is recommended the make up band be highlighted with a paint stick or some other form of marker prior to connection assembly.

15. Older pipe may in some regions have a make up triangle (possibly three) hard stamped on the pin ends as a visual indicator of complete make up. When made up the coupling face should reach the base of this triangle. Best practice is to check randomly that the distance from the base of these triangles to the pin nose corresponds to the make up loss indicated on the product data sheet.

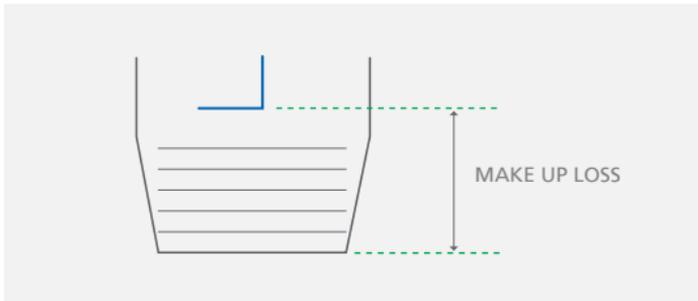
16. In the absence of either a MUL indicator or hard stamped triangle(s) on the pin end, the MUL should be indicated on every pin end to be run. In order to do this, measure the MUL length (indicated on the Product Data Sheet) from the nose of the pin end and make a mark on the pin OD.

17. The MUL should be applied on at least one point of the pin OD, however it is good practice to apply the MUL mark at 3 points round the OD of the pin, this allows faster identification of the MUL mark.



NOTE: IF FOR ANY REASON THE DATA SHEET FOR THE SPECIFIC PRODUCT IS NOT AVAILABLE ON LOCATION THE MAKE UP LOSS CAN BE DETERMINED BY MEASURING FROM THE TORQUE SHOULDER TO THE FACE OF THE BOX, AS ABOVE.

18. The most efficient method of MUL marking is as below, this allows instant identification of where the MUL marks are on the pipe OD, the vertical line being easily identifiable above any extruded thread compound.



Running

1. The use of a stabbing guide is strongly recommended.
2. The use of a weight compensator is strongly recommended for large OD and heavy weight pipe.
3. To avoid cross threading stab pipe in a smooth controlled fashion ensuring the pipe is vertical when doing so, continue to support and stabilise the pipe throughout the stabbing and make up operation.
4. Upon commencement of initial rotation use low RPM (5 RPM or below) in order to ensure the pipe has not cross threaded during stabbing.
5. If cross threading is evident, immediately reverse rotate the pipe, completely disassemble, clean and inspect both connections.
6. Maximum spin in speed should not exceed 15 RPM.
7. Apply power tong at low RPM (do not exceed 5 RPM), for final make up.

Pulling

1. Automatic stabbing system or stabber is highly recommended to maintain the pipe in a vertical position.
2. The use of a stabbing guide is recommended to assist in centralising the pin to prevent hang up.
3. A weight compensator is strongly recommended for large OD and heavy pipe.
4. Apply the back up tong jaw on the lower part, over the mill end of the coupling.
5. Apply power tong in low RPM (3-5 RPM) to break the connection, ensuring the pipe is stabilised during the break and spin out process.
6. Visual inspection is recommended to classify the thread condition. Any rejected connections should be clearly marked and segregated for further investigation.
7. Apply clean, dry thread protectors after applying storage compound on clean, dry connections.
8. Storage / thread compound should always be applied to connections post job, even rejects.
9. Do not apply storage compound to Dopeless® connections.
10. For long term storage of Dopeless® connections, refurbishment by qualified personnel prior to applying Dopeless® specific protectors is recommended.
11. Ensure clean, dry, Dopeless® protectors with seal rings correctly in place are installed.