TPS TECHNITUBE RÖHRENWERKE GMBH

TPS Multiseal

Running Procedure

Pipe Preparation & Running Procedures
(all Types and Grades)

Contents

1. Introduction

Running TPS Multiseal premium connections is characteristic of running several alternate premium connections that are common in the market.

1.1 General

1. Take care against damage (dropping, hit e. g.).
2. Use enough non-metal-timbers for storage under each layer of bundles/tubes.
3. Never place the timbers at the Connection Area => ensure distance from both ends.
4. Place timbers for each layer equally spaced and in the same position to avoid bending from weight.
5. If tubes are bundled without distance pieces => ensure that the distance from tube ends to the straps is enough to avoid bending, caused by different diameters.
6. Never place wrenches or tongs at PIN-End or BOX-End Areas to avoid deformation.

Note: *Reference Appendix A, Pipe Storage and Bundling*

2. Equipment & Pipe preparation

In order to ensure connection performance, it is extremely important to follow the guidelines recommended so as to apply the running and thread lock compound properly. Before applying the thread compound on the connections, ensure that the connections are thoroughly clean and dry.

Handling plugs should be installed at all times when the pipe is moved to or from the rig floor.

2.1 Alignment

1. Check the traveling block and rotary hole alignment.

2. Check centerlines of the suspended pin over the box, making adjustments if necessary.

Torque application

The recommended torque values for TPS Multiseal connections should always be used. Updated torque values can be found on our website: www.tpsd.de

When combining different weights or different grades, use the lower of the two torque values.

2.2 Pre-running

1. Locate and inspect all necessary accessories and tools on location, such as: pup joints, crossovers, float equipment, stabbing guides, handling plugs, single – joint elevators, thread compound, etc.

2. Verify interchangeability with size, weight and connection type.

2.3 Drifting

1. Be careful not to damage connections during drifting operations.

2. Drifting should be done prior to cleaning or inspecting the connection.

3. Blow out the pipe ID from box to pin to completely remove loose mill scale and accumulated debris.

4. Ensure drift mandrels conform to API dimensional requirements or specified special drift requirements.

5. Drift from box to pin.

6. For drift testing internal plastic coated tubes use non-metallic-mandrels, only.

7. A non-ferrous drift is required for Chromium Steels.

8. Pipes that does not pass the drift test should be marked with a red paint band on either side where the drift is sticking and then laid aside for further investigation. „No drift“ should be marked on the pipe to avoid confusion with other types of damage.

2.4 Cleaning

1. Thoroughly clean and dry the connections using one of the following methods:
   - A nonmetallic brush and cleaning solvent.
   - Steam clean with water and cleaning solvent.
   - A rotary bristle brush with jetted water and / or cleaning solvents

Note: Diesel is not recommended as a cleaning solvent.

2. Wipe or blow out solvents and / or water from the thread roots and from the bottom of the box. During freezing weather, be careful to ensure that no moisture remains on the connection. Ice may prevent proper seal and shoulder engagement during make – up.

3. Cleaning Operations must comply with the Environmental Regulations.

2.5 Inspection

1. Pipes should be situated so that the joints may be rolled 360 degrees to facilitate complete cleaning and inspection on a rack ca. 1 m high.

2. Inspect all connections for damage such as out-of-round, handling damage, dents, mashed areas, rust and scale. Seal areas must be free of longitudinal or transverse cuts, scratches, corrosion pitting, rust and scale.
   Segregate and label properly all pipes with suspect connection damage. Further evaluation and hand repair must be performed by a TPS Field Service Specialist.
   Records should be kept on all repairs and rejects.

2.6 Connection preparation

1. Handle all pipes with thread protectors in place.

2. API modified thread running compound is recommended for TPS Multiseal connections.

   Caution:
   - the thread grease has to be stirred well prior to use (Oil-remains are not acceptable)
   - the thread grease and the brushes have to be clean
   - no foreign particles shall be applied

3. When the service temperature exceeds 120°C use a thermal grade running compound.

4. In freezing temperature use an Arctic-grade running compound. The compound should be free of water and ice particles and kept warm in the dog house or with a warming device.

5. When running "TR" (Teflon Ring) connections:

   - When running used tubing: Remove the used seal ring if damaged carefully, without using sharp edged tools, be careful that the internal coating and the 14° seal are not damaged.
   - Use only new seal rings.
   - The seal ring groove on the BOX side must be clean.
     Do not pre-form the seal ring, only move it past the 14° seal area up to the face of the groove.

3. Running

1. Slip-type elevators are recommended. Elevators should not be set on the upset area.

2. Bottleneck or shoulder type elevators are not recommended.

3. Single-joint elevators are recommended as they improve stabbing alignment and promote safer operations. When running the connections, ensure elevators are bored to the appropriate diameter and are used in conjunction with handlng plug.

4. A modern single length weight compensator is highly recommended.

5. Check for traveling block and rotary hole alignment.

6. Tubing power tongs are required for final torque application. Dies that are improperly mounted or poorly maintained can damage the pipe body. Torque measurement equipment must be calibrated.

7. The use of the torque turn monitoring system is absolutely necessary/rule. Verify the calibration dates on the torque turn equipment load cells.

3.1 Handling

Handle all pipes with thread protectors in place.

1. If pipes are to be left on the rack for an extended period of time prior to running, apply a suitable compound to the thread and seal areas. Place dry, clean and damage-free thread protectors on all connections.

2. Any accidental mishandling is cause for re-inspection of connections.

3. Before rolling or hoisting, install a handling plug (without seal elements) in the box end and ensure pin-end protectors are in place. Boxes that will not accept a handling plug should be set aside.

3.2 Stabbing

1. To prevent damage from accidental mishandling, the pin thread protector should not be removed until the joint is ready to stab.

2. While the pin is hanging in the derrick and the box is suspended in the rotary table, remove the pin protector and handling plug. Clean and re-inspect the connections if conditions warrant.

3. The tubes must be aligned with each other (elevator alignment) during stabbing and screwing, make adjustments if necessary.

4. Apply a light even coat of thread compound to the TPS-MULTISEAL box and pin. 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.
   Do not apply any foreign matter, keep clean/protect the thread dope and the brushes used.

Note: The recommended thread compound quantity is mentioned on Appendix C

5. Ensure that stabbing guides are used and connections are carefully stabbed.

6. Very slowly, lower the joint hanging in the derrick. Carefully stab the pin into box and turn the pipe by hand or strap tong at least three (3) turns, to be sure that both cylindrical thread section engaged.

Note: If no single length weight compensator is available, we recommend to mark the outside surface of the PIN and BOX connections to show the start of the thread run in. These markings must line up whilst stabbing and must be visible while using the stabbing guide (this is to ensure a large bearing surface on the threads for the weight of the tube).

3.3 Make up

1. Power tongs are required to obtain final recommended torque values. Torque values of Data Sheets may need to be adjusted by running compounds friction factor if it is different to 1.

2. Hand make-up at least three (3) turns is required. To extend the life of connection it is recommended to make up the pin into the box by hand or, if necessary, with a strap wrench with a smooth even motion, so that only a small gap is visible between the connections.

3. Position the power tongs on the pipe such that the tongs and backups are sufficiently above and below the connections. Make up 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. Restart make up rotation. If premature torque is still present, back out the connections and inspect for damages before proceeding.

4. While making up, the upper end of the pipe must be held aligned. The power tong lead line must be 90° to the power tong for the working position (if applicable). The hanging line must be straight up in the working position ➔ otherwise bending will negatively influence the connection as a result of the tong weight.

5. If the pipe has a tendency to wobble greatly during make up due to harmonics, wind, or rig motions, reduce the make up rotation speed to prevent damage.

6. Always check that make up acceptance criteria are met.

Note: When making up accessories, verify that both the power tong and back up tong have the correct diameter and grip properly. Incorrect tong dies or size can deform or damage the pipe body.

Note: Reference Appendix B for torque graph acceptance criteria.

4. Lowering

1. Pipe should be picked up and lowered carefully. Care should be exercised in setting floor slips to avoid shock-loading the string.

2. Ensure the elevator slips are set well below the connection area.

3. Keep the handling plug in the box connection until the joint is lowered and set in the floor slips. The plug will help keep drilling mud off the thread and seal areas if overflow occurs.

4. If fill-up is required during running, the handling plug should be left installed in the box to prevent the fill-up hose from damaging box threads and seals.

5. Do not hammer on the box to break the handling plug free. If necessary, hammer on the handling plug flang.

5. Pulling

1. The weight compensator should be used to avoid thread damage.

2. Use power tongs in low gear at no more than 5 RPM to break out connections.

3. Do not hammer on connections to assist breakout as this may damage the pipe or connections.

4. During breakout and spinout, the pipe must be vertical and allowed to spin freely, which may necessitate slacking off or unlatching elevators.

5. Excess torque during breakout or irregular rotation speed indicates poor alignment that may cause damage. Any rotational movement should be stopped until the cause is determined and corrected.

6. Take care not to over rotate during back-out so pin connection does not “drop” back into box.

7. Care should be exercised when lifting the pin out of the box. Maintaining breakout rotation and keeping the pin centered in the box when disengaging can prevent thread hang-up and damage.

6. Storage

1. Handle all pipes with protectors in place.

2. Immediately after pulling the tubes out of the well, clean all pipes thoroughly to remove corrosive fluids from the outside and from the internal bore.

3. The disengaged connections should be cleaned to remove dope, mud and corrosive fluids, dried and preserved with standard anti-corrosion compound and protected against damage with clean, undamaged thread protectors.

4. Reject connections must be properly marked.

5. Pipes which are EMI / Flux Leakage tested after use must be demagnetized.

Note: Damaged connections also require protection, after inspection, the damage may be field-repairable. Failure to apply protectors or storage compound may render the connections unsuitable for field-repair and need to recut or scrap.

High Chrome Steel Tubular Handling and Storage Procedure

At high-alloy tubes *(chrome content 9%, 13% and higher, CRA = Corrosion Resistant Alloys)* the following additional requirements should be considered for handling, transport and storage *(suitable packaging material should be used)* to avoid contact corrosion.

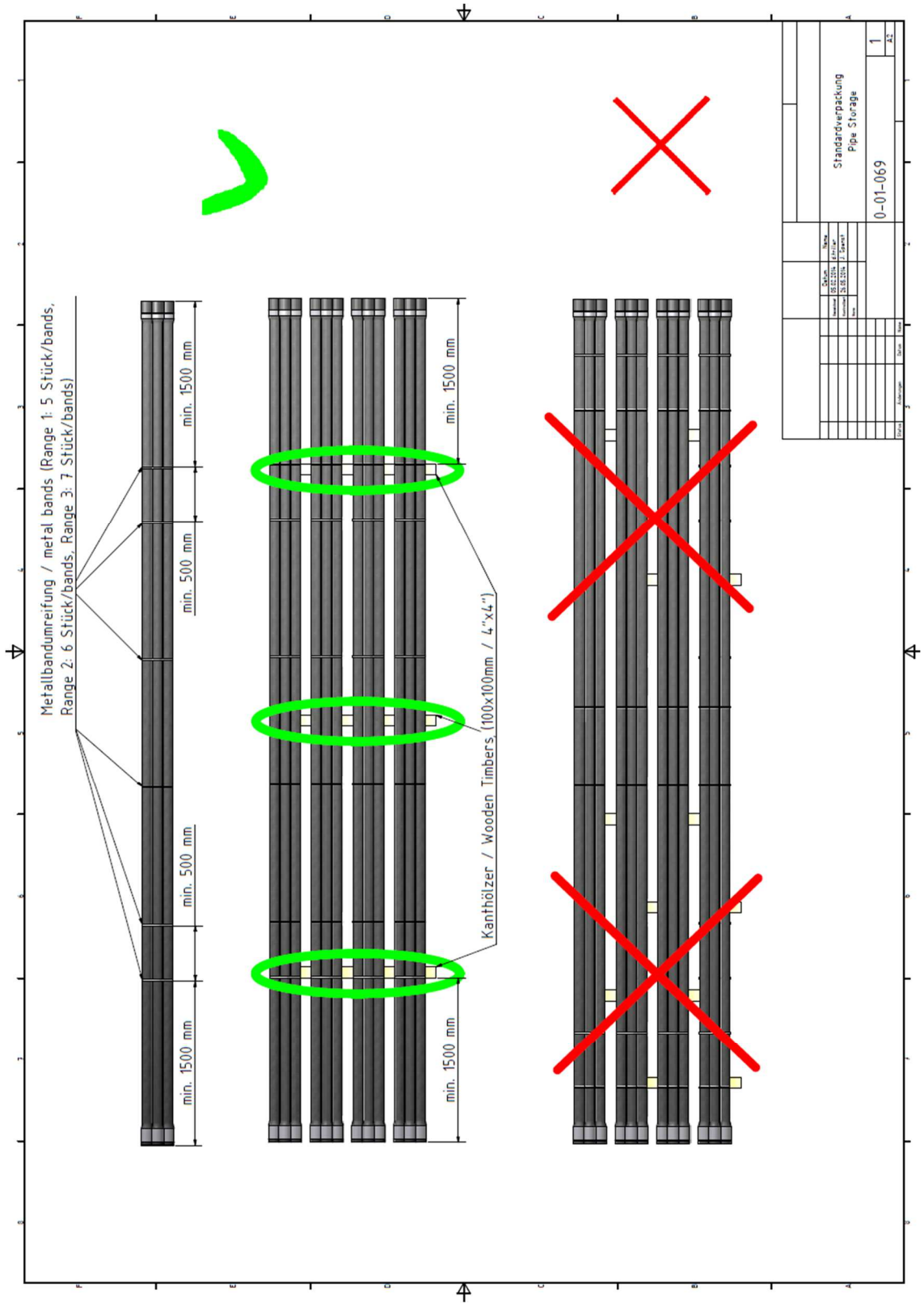
Forklift forks	→ should be protected with plastic
Belt / sling	→ Nylon or protected by plastic
Storage separators	→ use of hardwood or aluminium
Impact protection	→ bumper rings (prevents clashing of tubes during rolling)
Inspection benches	→ plastic, aluminium or wood
Drift mandrel	→ plastic or aluminium
Paint marking	→ no fluorides permitted
Mousehole (mouse hole)	→ covered with plastic
"V Door"	→ protected with plastic or wood

The additional equipment such as backup tong, power tong, tong jaws, Single Joint Weight Compensator etc. should be protected at all contact points and friction points to avoid any contact with carbon steel.

To avoid corrosion and cracks, tubes must be stored in Rap Systems or loose, each layer on top of non-metallic-timbers (three or more, depending on tube length), in dry and clean conditions.

No contact with ferrous metal is permitted.

7. Appendix A „Storage“



8. Appendix B „Evaluating TPS Multiseal Torque Graphs“

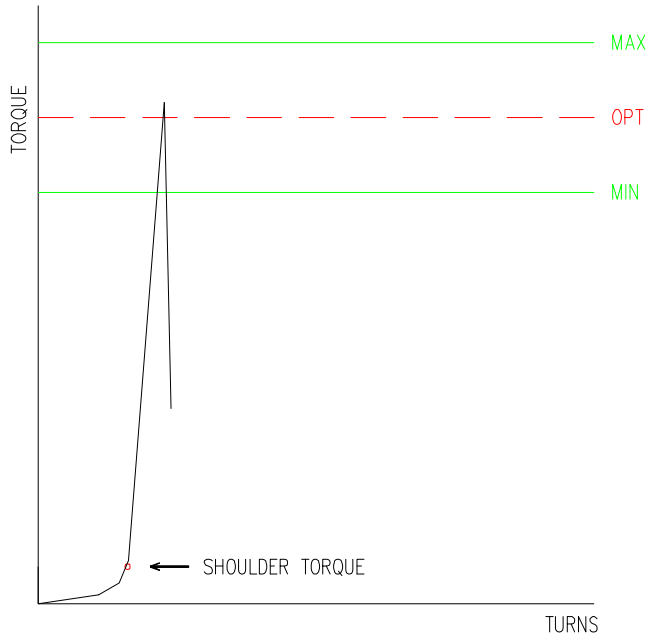


Figure 1: Typical Acceptable TPS MULTISEAL Torque – Turn Graph

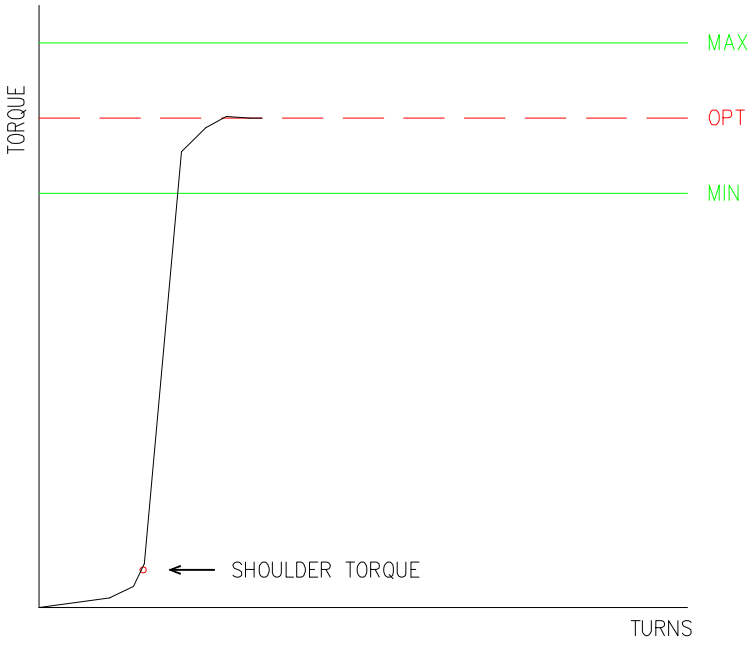


Figure 2: This graph indicates tong slippage or connection yielding. TPS MULTISEAL connections can withstand very high torques before yielding. This type of graph normally indicates tong slippage.
⇨ Breakout and evaluate

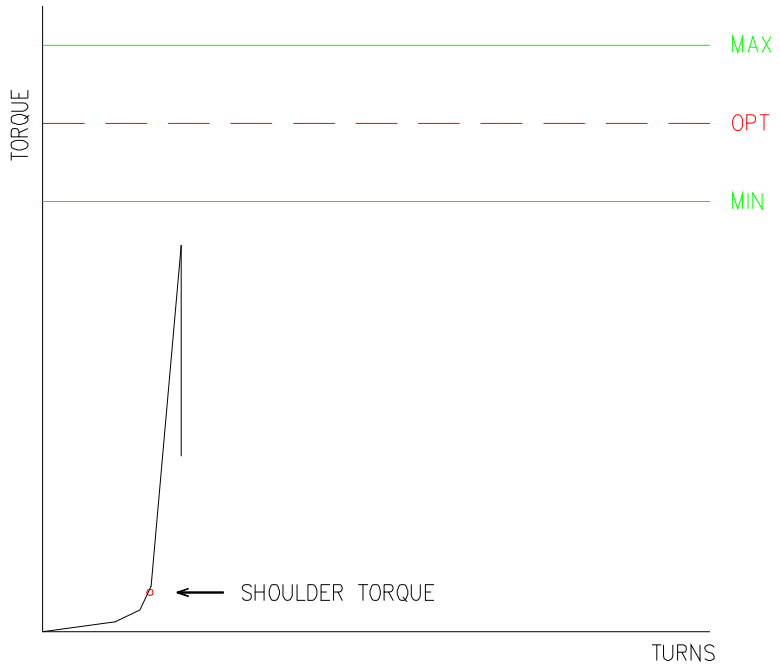


Figure 3: Minimum specified torque has not been optained.
⇨ Breakout and evaluate

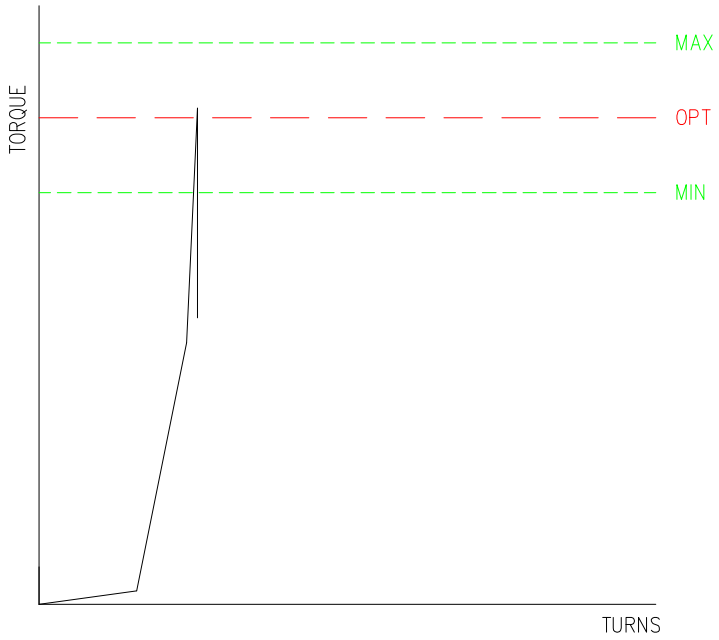


Figure 4: This graph indicates little or no seal interference. Ensure that the reference torque of the computer monitoring system is set low enough to register seal interference.
⇨ Breakout and evaluate

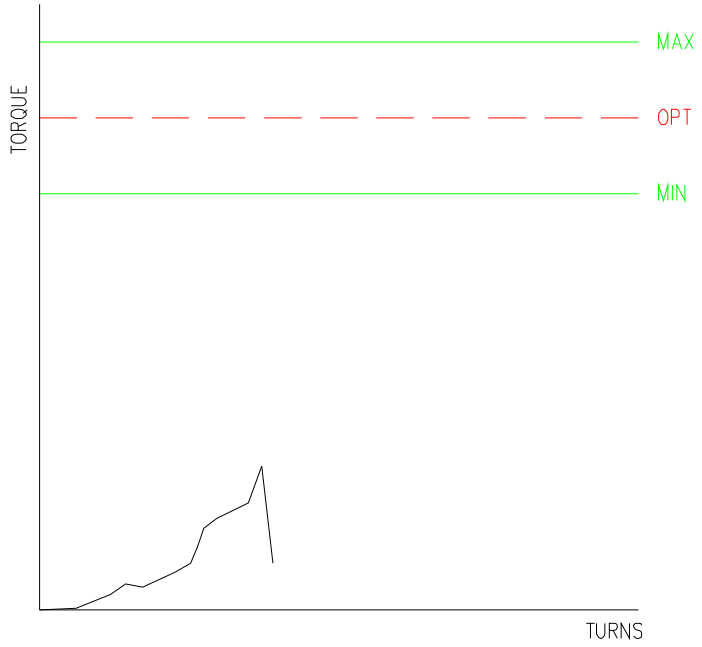


Figure 5: This graph indicates thread interference prior to seal engagement.
⇨ Breakout and evaluate.

9. Appendix C „Thread Compound"

9.1 Recommended Thread Compound Quantity

Table 1: Recommended thread compound quantity (cm^3)

Size / Connection	1,050" MS-TS-8	1,315" MS-TS-8	1,66" MS-TS-8	1,90" MS-TS-8	2 3/8" MS-TS-8	2 7/8" MS-TS-8	3 1/2" MS-TS-8	4" MS-TS-8	4 1/2" MS-TS-8
Quantity (grams)	**6**	**8**	**10**	**11**	**14**	**17**	**21**	**24**	**27**

Size / Connection	2 3/8" MS-TS-6	2 7/8" MS-TS-6	3 1/2" MS-TS-6	4" MS-TS-6	4 1/2" MS-TS-6	5" MS-TS-6 S	5 1/2" MS-TS-4
Quantity (grams)	**14**	**17**	**25**	**28**	**32**	**33**	**55**