

IPSCO CONNECTIONS RUNNING MANUAL

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IPSCO RECOMMENDED FIELD PRACTICES

- TORQ® SFW®
- TORQ® QXW®
- TORQ® DQW®
- ULTRA™ SF & SFII
- ULTRA™ FJ
- ULTRA™ FX
- ULTRA™ QX
- ULTRA™ GX
- ULTRA™ DQX & DQX-HT
- ULTRA™ DQX-SR
- BPN
- BPN-SR

TENARIS INTRODUCTION

Tenaris is a leading supplier of tubes and related services for the world's energy industry and certain other industrial applications. Our mission is to deliver value to our customers through product development, manufacturing excellence, supply chain integration, technical assistance and customer service, aiming to reduce risk and costs, increase flexibility and improve time-to-market.

Wherever we operate, we are committed to safety and minimizing our impact on the environment, providing opportunities for our people, and contributing to the sustainable development of our communities. Our employees seek constant improvement by sharing knowledge across a single global organization.

Tenaris acquired IPSCO on January 2, 2020 from PAO TMK. For any questions about these technologies, please contact your local commercial or technical sales representative.

FIELD SERVICE SUPPORT

Please contact our Tenaris field service technical support group at FieldServices@tenaris.com.

QUICK REFERENCE GUIDE

QUICK REFERENCE GUIDE

This document sets forth the applicable guidelines for the running of casing and tubing with IPSCO connections. Connection specific instructions, such as thread compound application recommendations, torque turn graphs, make-up RPM and downhole rotation can be found under their respective sections.

The rig crew with the supervision of a Field Service Technician certified by Tenaris should conduct all running operations in accordance to API Recommended Practice 5C1. Additionally, they should observe all generally accepted good running practices and handling guidelines for premium casing and proprietary connections.

References: API 5C1 and API RP 5A3

Equipment: (Page 8)

1. Calibrated power tongs
2. Calibrated CRTs
3. Circulating and/or cement sub
4. Handling plugs (lift nubbins)
5. Stabbing guide
6. Crossovers subs/joints as necessary
7. Latest revision data sheet of the appropriate connection
8. Thread compound and applicator “moustache” brushes
9. Any accessories to be used (float equipment, etc.)

Preparation: (Page 14)

1. Verify that all equipment mentioned above is on hand, in serviceable condition, and is of the appropriate connection, size, weight and grade for the string being run.
2. Ensure that every component being run is drifted prior to cleaning and inspecting IPSCO connections.
3. Inspect rig alignment, power tongs snub line position, and torque turn unit calibration.
4. Verify that either collar type or slip type elevators are used. Never use bottleneck elevators.
5. Review all recommended running and handling guidelines with the Customer Representative, Rig Personnel, and all other 3rd party personnel (casing crew, torque turn, etc.) prior to beginning operations.

Handling Casing: (Page 17)

1. When moving casing, always ensure thread protectors are in place to prevent accidental damage to connections.
2. Handling plugs should be made up hand tight to ensure proper engagement for safe lifting.
3. Ensure handling plugs stay free of debris which can be transferred to the connection.
4. Use stabbing guides to minimize risk of damage to threads and seals.

Connection Make-up: (Page 23)

1. Properly apply thread compound to connections per the connection specific thread compound application recommendations.
2. Follow the connection's appropriate make-up torque values and make-up RPM.
3. Ensure pipe can spin freely during make-up to avoid anomalies in connection make-up.
4. If acceptable connection make-up is not achieved, the connection should be broken out, cleaned, and inspected. The connection can be made up again if it is in good condition.

GENERAL GUIDELINES

GENERAL GUIDELINES

EQUIPMENT

Tools

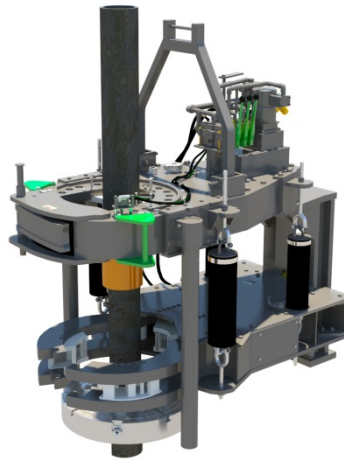
1. Circulating, cement, and crossover subs shall have pin and box ends inspected prior to each use and shall be verified they are compatible with the connections being run. TORQ® QXW®, TORQ® DQW®, ULTRA™ DQX, DQX-HT, DQX-SR, BPN, BPN-SR and ULTRA™ GX connections are interchangeable between different weights of the same connection and nominal OD. TORQ® SFW®, ULTRA™ SF, SFII FJ, FX, QX connections require the use of a crossover when changing between weights.
2. Stabbing guides are essential in running IPSCO connections to help prevent damage to critical areas of the connection. Ensure that the stabbing guide is appropriate for the connection being run and in serviceable condition.
3. **Handling plugs shall be inspected prior to use. Only authorized handling plugs that are manufactured by and received from certified Tenaris facilities or representatives shall be used.**

Elevators

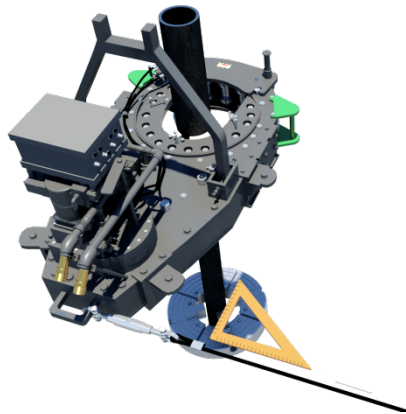
1. Single joint elevators of the appropriate size shall be used.
2. Slip type elevators shall be used on all IPSCO integral joint connections (TORQ® SFW®, ULTRA™ SF, SFII, FJ, FX, QX).
3. Collar type elevators may be used on non-special clearance threaded & coupled connections (TORQ® QXW®, ULTRA™ DQX, DQX-HT, DQX-SR, BPN, BPN-SR, BPN, BPN-SR and ULTRA™ GX).
4. Collar type elevators can only lift up to the engaged coupling face cross-sectional area which in some cases may be less than the pipe body area.
5. **Bottleneck elevators (Drill Pipe) shall not be used on any IPSCO connections.**

Power Tongs

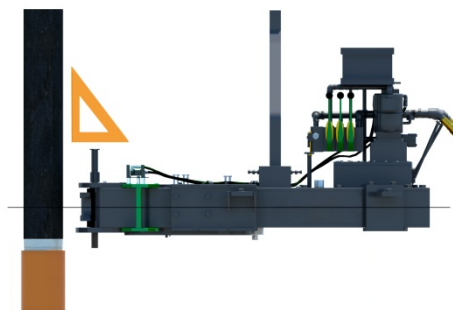
1. Power tongs are critical for properly making up a connection. They ensure that the connections are not over or under torqued and are properly aligned and gripped.
2. Power tongs shall be calibrated at least annually and be within the required torque range of the pipe size being run. It shall have the correct size jaws properly installed to prevent damage to the pipe.
3. Integrated back-up tongs are recommended for 7-5/8" casing and smaller. The back-up tongs shall be able to freely move vertically relative to the tongs while staying parallel to the tongs to avoid misalignment.
4. Back-up tongs are recommended for the first 20 joints to prevent the string from rotating.



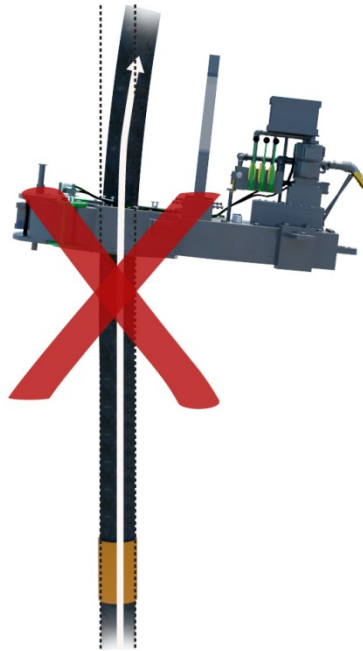
5. Power tong grip pressure should be as low as possible and the gripping area should be as large as possible to prevent damage to the casing and to obtain undistorted accurate torque turn graphs.
6. Wraparound die configuration is recommended for 13-3/8" casing and larger to prevent damage to the casing and to obtain undistorted accurate torque turn graphs.
7. The snub line shall be at 90° to the power tongs arm and horizontal to ensure accurate torque readings.



8. The power tongs shall be perpendicular to the casing. A level may be used to ensure that the power tongs, back up tongs, and the snub line are horizontal.



9. The weight of the power tongs shall not rest on the casing as it will cause bending, misalignment and can damage the seal and thread areas. Improper torque turn graphs might also be obtained.




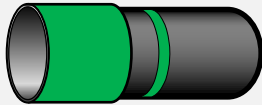
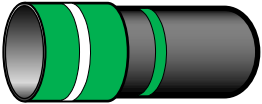
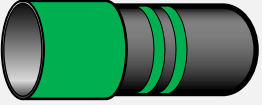
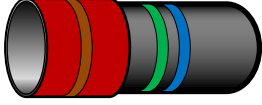
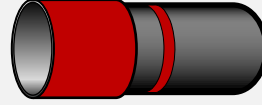
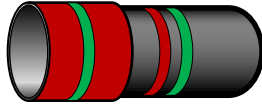
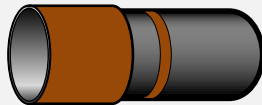
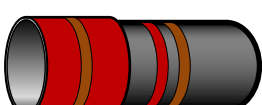

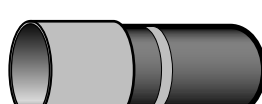
10. Torque turn monitoring equipment use is required to verify proper make-up of IPSCO connections. The unit should be capable of a minimum pulse rate of 1000 samples per turn and with up-to-date calibration of no more than 1 year.
11. Improper equipment can result in poor make-up graphs and damage to the connection.
12. **Review monitoring equipment settings to ensure RPM and Torque vs Turn will be obtained prior to start running pipe.**

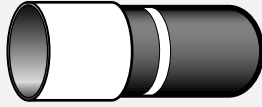
Casing Running Tool

1. Care must be taken to ensure that the torque indicators and over-torque dump valves are accurate if equipment, such as a CRT (Casing Running Tool) or other method, is used to make-up the connection other than the preferable power tongs method.
2. Electronic interference is possible with remote torque monitoring equipment that might cause distortion in the Torque vs Turn graphs.
3. Ensure that the external grip segments are set at a proper position on the pipe body away from the connection to prevent gripping onto the connection and consequently dropping the string.
4. Ensure that the internal slip segments are set at a proper position within the pipe body away from the connection to prevent damaging the connection.
5. A flush mount spider and/or conventional rig rotary tongs are recommended for the first 20 joints to prevent the string from rotating.
6. **Review monitoring equipment settings to ensure RPM and Torque vs Turn will be obtained prior to start running pipe.**

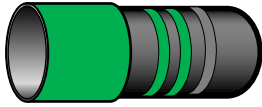
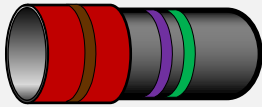
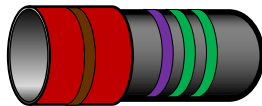
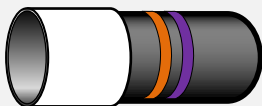
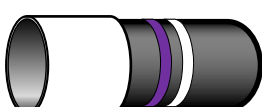
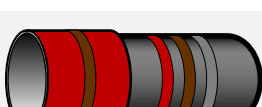

PIPE

API Color Codes

PIPE GRADE	PIPE (COLOR BANDS)	COUPLING		ILLUSTRATION
		ENTIRE COUPLING	BAND(S)	
H40	None or black band	None	None or Black	
J55 Tubing	1 Green	Green	None	
J55 Casing	1 Green	Green	1 White	
K55	2 Green	Green	None	
M65	1 Green 1 Blue	Uses L80 Type 1 Couplings		
N80 – 1	1 Red	Red	None	
N80 – Q	1 Red 1 Green	Red	1 Green	
R95	1 Brown	Brown	None	
L80 – 1	1 Red 1 Brown	Red	1 Brown	
C90	1 Purple	Purple	None	
T95	1 Silver	Silver	None	

PIPE GRADE	PIPE (COLOR BANDS)	COUPLING		ILLUSTRATION
		ENTIRE COUPLING	BAND(S)	
C110	1 White 2 Brown	White	2 Brown	
P110	1 White	White	None	
Q125	1 Orange	Orange	None	

IPSCO Proprietary Color Codes

PIPE GRADE	PIPE (COLOR BANDS)	COUPLING		ILLUSTRATION
		ENTIRE COUPLING	BAND(S)	
K55 HC	2 Green 1 Gray	Green	None	
I80	1 Purple 1 Green	Use L80 Type 1 Couplings		
I80 MS-1	1 Purple 2 Green	Use L80 Type 1 Couplings		
I95	1 Orange 1 Purple	Use P110 Couplings		
I110	1 Purple 1 White	Use P110 Couplings		
L80 HC	1 Red 1 Brown 1 Gray	Use L80 Type 1 Couplings		
L80 CYHP	1 Red 1 Brown 1 White	Red	1 Brown 1 White	

PIPE GRADE	PIPE (COLOR BANDS)	COUPLING		ILLUSTRATION
		ENTIRE COUPLING	BAND(S)	
P110 HC	1 White 1 Gray	White	None	
P110 MS-1	1 White 1 Blue	White C110 Couplings Accepted	1 Blue	
P110 MS-2	1 White 2 Blue	White C110 Couplings Accepted	2 Blue	
P110 CYHP	1 White 2 Orange	White	1 Orange	
P110 CY	1 White 1 Pink	White	1 Pink	
Q125HC	1 Orange, 1 Gray	Orange	None	
Q125 CYHP	1 Orange 2 White	Orange	1 White	

Corrosion Resistant Alloys

1. Extra care must be taken when running CRA (Corrosion Resistant Alloy) grades to not mar or gouge the pipe to prevent premature failure of the casing or tubing.
2. Movement of pipe from the pipe rack to the rig should be done using nylon or other soft strap instead of a metal sling, unless the metal sling is padded.
3. After the pipe is stabbed, nylon or other soft strap wrenches should be used to make-up connections to hand tight position. The use of spinning chains should be avoided to prevent damage to the casing or tubing.
4. Only non-marking wraparound dies shall be used to make-up the connection.
5. Only non-marking dies should be used in the slips.
6. The make-up speed should not exceed 10 RPM for 8-5/8" casing and smaller or 5 RPM for 9-5/8" casing and bigger.
7. Avoid metal to metal contact in the pipe rack by using a plastic bump ring.
8. Avoid metal to metal contact between pipe and handling equipment.
9. Handling plugs are required on threaded & couple connections using CRA to protect the threads and seals.
10. Avoid long term contact between carbon steel and CRA.
11. Ensure adequate padding on forks of forklift and on pipe rack.
12. The Field Service Technician shall inspect all connections to ensure an even coat of Molybdenum Disulfide (dry moly) covers the entire pin and box if not copper plated.
13. The use of copper plating is recommended but copper plating shall be used only in the box end of the connection. Do not apply "dry moly" to the copper plated area.
14. Molybdenum Disulfide grease "Moly Paste" shall be applied instead of thread compound to both pin and box if the connection is not copper plated.

PREPARATION

Drift

1. Compressed air may be used if available prior to drifting. Each joint must be blasted from box end to pin end.
2. The pipe shall be drifted with the use of a drift mandrel of the appropriate size prior to cleaning and inspecting IPSCO connections.
3. It is a good practice to drift the casing or tubing while the pipe is on the rack.
4. Drift requirements:
 - Drift mandrel must meet the API 5CT dimensional requirements.
 - Special drift mandrel must be used for pipe with special drift requirements.
 - Drift mandrel must be clean.
 - Drift mandrel must not damage the connection.
 - Drift from box end to pin end.
 - Plastic or plastic-coated drift mandrels must be used on all internally coated and CRA pipe.
5. Any joints that do not drift shall be clearly marked red and segregated from the remaining prime joints.
6. Do not force the drift mandrel through the pipe.
7. Standard API Drift Dimensions:

PRODUCT

MIN. STANDARD DRIFT DIMENSIONS

CASING	LENGTH		DIAMETER	
	in.	mm.	in.	mm.
< 9-5/8	6	152	$d - 1/8$	$d - 3.18$
$\geq 9-5/8$ to $\leq 13-3/8$	12	305	$d - 5/32$	$d - 3.97$
> 13-3/8	12	305	$d - 3/16$	$d - 4.76$
TUBING				
$\leq 2-7/8$	42	1,067	$d - 3/32$	$d - 2.38$
> 2-7/8 to $\leq 8-5/8$	42	1,067	$d - 1/8$	$d - 3.18$
> 8-5/8 to < 10-3/4	42	1,067	$d - 5/32$	$d - 3.97$

d Nominal Inside Diameter

Verify with API 5CT table C.28 and E.28

Cleaning

1. Thread protectors should only be removed, and cleaning conducted, immediately prior to running the casing or tubing. This will limit the exposure of the connections to the environmental conditions on location that could have adverse effects on the connections (e.g., water, dust, mud, etc.).
2. IPSCO connections shall be cleaned prior to make-up to remove the storage compound.
3. Compressed air shall be blasted from box end to pin end if available.
4. A pressure washer, steam cleaning with water or solvent, cleaning solvent and rags, or non-metallic bristle brushes that do not leave residues, can be used. Any residues must be wiped or blown out from the thread roots and any other entrapped areas of the connection. The pressure washer must not remove the “dry moly”.
5. Pipe should be able to be rolled a minimum of one turn to ensure that all areas of boxes and pins are cleaned of storage compound and debris.
6. Lubricating oil may be used as additional measurement to prevent surface corrosion in the connection.
7. The connection shall not be exposed after cleaning and before running the connection for more than 3 hours without lubricating oil or a corrosion inhibitor.
8. Spray the dried connection with an even coat of “dry moly” and allow it to dry on CRA grades. Do not apply “dry moly” to the copper plated end.
9. Clean thread protectors with solvent and rags or non-metallic bristle brushes.
10. Never use metal brushes, gasoline or diesel to clean ULTRA™ and TORQ® connections.

Inspection

1. Only Field Service Technicians certified by Tenaris are authorized to inspect and field repair ULTRA™ and TORQ® connections.
2. The stencil information on the pipe should be recorded. Photos of mill and threading stencils may be included in the reporting documents.
3. All ULTRA™ and TORQ® connections should be thoroughly cleaned and dried at the rig site prior to inspection.
4. A visual inspection of all pins and boxes on location shall be conducted prior to running the casing or tubing.

5. Features that should be inspected if applicable include:
 - Seal surface
 - Thread form
 - Run-in and run-out threads
 - Torque shoulder
 - Connection face
 - Proper coupling installation
6. Potential damages that might occur include:
 - Scratches
 - Corrosion
 - Pitting
 - Dent
 - Galling
 - Discoloration
7. The seal area must be free of the above-mentioned damages and may be buffed to remove only a minor blemish with the use of a heavy duty hand pad such as Scotch-Brite™ 7446 or 7440 with light pressures without the use of power tools. Molybdenum Disulfide must be applied on the buffed surface.
8. The entire connection except for ULTRA™ DQX, ULTRA DQX-SR, ULTRA DQX-HT, GX, BPN and BPN-SR must be inspected to ensure at least 75% coverage of dry moly. Dry moly must be applied to any connections where more than 25% coverage of dry moly is not present. Dry moly is not required if the connection is phosphated.
9. Refer to the specific connection Field Repair for field repair instructions.
10. If any areas of the threads or seals are found to be unserviceable, these connections and joints shall be clearly marked red and segregated from the remaining prime joints.
11. Install centralizers and any other tools attaching to the OD of the pipe if available per company representative directive.
12. Apply thread compound to the connection per the specific connection Thread Compound Application section.
13. Install cleaned and dried pin thread protectors at hand tight position.

HANDLING

API 5C1 shall be abided by in addition to these recommended procedures in the storage, loading, unloading and handling of all OCTG in the yard and on rig location.

Thread Protectors

1. Thread protectors shall be installed whenever pipe is being moved.
2. Ensure that thread protectors are clean prior to installation.
3. Thread protectors for TORQ[®] QXW[®], TORQ[®] DQW[®], ULTRA[™] GX, ULTRA[™] DQX, ULTRA DQX-SR, ULTRA DQX-HT, BPN and BPN-SR connections are interchangeable between different weights of the same connection and nominal OD. All other connections require a specific thread protector for each size and weight.
4. Ensure the correct thread protectors are being used. Thread protectors are labeled with the connection name, size and weight. Thread protectors for TORQ[®] QXW[®], TORQ[®] DQW[®], ULTRA[™] GX, ULTRA[™] DQX, ULTRA DQX-SR, ULTRA DQX-HT, BPN and BPN-SR are labeled only with the connection name and size.
5. Wrong thread protectors can potentially damage the connection or become loose and falloff during handling or transportation.
6. Pin thread protectors shall remain in place until the pipe is hanging in the derrick and is ready to be stabbed. Quickie protectors may be used.
7. If tubing or casing is expected to sit on the rack for an extended period after cleaning, then a fresh coat of running compound shall be applied to the entire connection and clean thread protectors shall be reinstalled hand tight.
8. If tubing or casing will be returned to the storage yard, then a fresh coat of storage compound shall be applied to the entire connection and clean thread protectors shall be reinstalled with the use of a wrench or steel bar.
9. Do not over tighten the thread protectors.

Handling Plugs

1. Handling plugs are required when running integral connections and recommended in threaded & coupled connections.
2. Handling plugs are required for threaded & coupled connections if tools will be run inside the coupling prior to make-up.
3. Handling plugs provide protection for the box threads and seals when the pipe is run.
4. All IPSCO handling plugs are specially made with modified dimensions which differ from the production connection design. Each ULTRA[™] handling plug manufactured by Tenaris or a licensee has a unique serial number located on the “head diameter” area. The head diameter is the biggest outside diameter on the handling plug and it is the same as the API coupling outside diameter.
5. Handling plugs for TORQ[®] QXW[®], TORQ[®] DQW[®], ULTRA[™] GX, ULTRA[™] DQX, ULTRA[™] DQX-SR, ULTRA[™] DQX-HT, BPN and BPN-SR connections are interchangeable between different weights of the same connection and nominal OD. However, ensure that the Handling Plug meets any required drift. All other connections require a specific handling plug for each size and weight.
6. The characteristics of a proper IPSCO handling plug include:
 - Machined ID
 - Proper Head Diameter
 - Serialization
 - Holes are located on the head diameter area

7. Handling plugs shall be cleaned, dried and inspected before each run and at any point they are dropped or come into contact with foreign debris.
8. The handling plug and the connection box end should be free of any debris to ensure proper thread engagement and prevent damage to the connection.
9. Handling plugs shall be installed to a firm, hand-tight position to ensure full engagement for safe handling with the use of a wrench or a steel bar through the holes provided in all Tenaris handling plugs.
10. Never use a hammer to tighten the handling plug or strike the box to loosen and remove the handling plug.
11. Handling plugs should remain in place in the box end until the string is set in the slips and the next pipe is ready to be stabbed. This will ensure that the connection box has protection during the lowering of the string and while the string is filled with mud if a fill up tool, CRT system or mud valve is being used.
12. All IPSCO handling plugs will shoulder with the coupling or box end face except for TORQ® SFW®, TORQ® DQW® and TORQ® QXW®.
13. Handling plugs are designed to hold only up to 3 joints or 10,000 lbs and shall not be used to raise or lower the tubing or casing string.
14. The use of unapproved handling plugs may result in serious personal injury, improper thread engagement, reduced handling capacity, dropped pipe or damage to the threads and seals of IPSCO connections.
15. All handling plugs shall be properly maintained and periodically re-gauged. Using improperly maintained tools can lead to serious injuries.

Thread Compound

1. The use of proper thread compound is critical to the performance and protection of the connection.
2. Tenaris recommends the use of thread compounds that meet or exceed ISO 13678 or API RP 5A3 requirements.
3. A specified dropping point of 450°F (232°C) or higher in the thread compound data sheet is recommended for elevated temperature.
4. A specified dropping point of 727°F (386°C) or higher in the thread compound data sheet is recommended for steam injection applications.
5. A specified dropping point in the thread compound data sheet of 150°F (66°C) or higher than the maximum well temperature is preferable.
6. Artic grade is recommended for applications where the outside temperature is below 32°F (0°C).
7. The thread compound expiration date must be reviewed to confirm that it is serviceable.
8. The thread compound shall be stirred immediately prior to its use and frequently throughout its use to prevent settling of heavy metals or large particles in metal free running compound.
9. The thread compound bucket should be covered to prevent the accumulation of water when raining. Discard thread compound with accumulated water as this may cause distorted torque turn graphs and corrosion in the connection.
10. Lubricating oil may be used between the connection cleaning and thread compound application as an additional measure to prevent corrosion in the connection.
11. Thread compound may be applied directly to the connections without removing the light oil base.
12. The use of an applicator “moustache” brush is recommended for the box and a paintbrush for the pin to best control the application and quantity of thread compound.



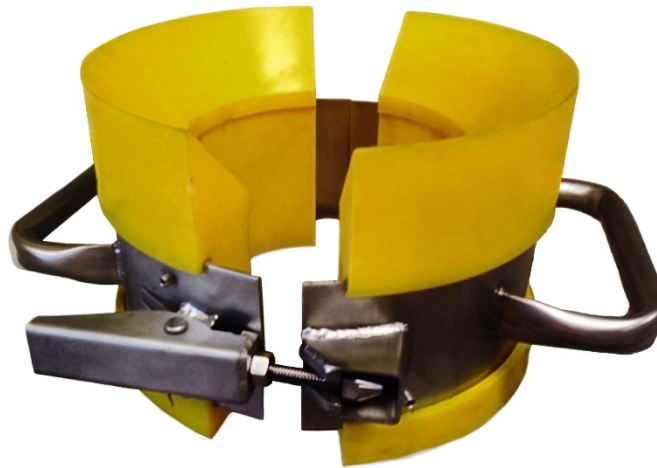
13. Thread compound should be applied per the specific connection Thread Compound Application section of the IPSCO RECOMMENDED FIELD PRACTICES.
14. Prior to stabbing, verify that the proper distribution of thread compound on both box and pin has been achieved.
15. Prevent the mud from covering the threaded and seal area of the box and wipe the box if the mud overflows. Overflowing the mud through the box can cause distorted graphs and may affect the thread compound performance.
16. Add 10% to the optimum make-up torque when using thread locking compound. A torque shoulder or wedge lock must be clearly visible to ensure proper make-up. Apply the thread locking compound to the threads only and apply running compound to the seal area.
17. Do not dilute thread compounds with diesel, motor oil or any other substance.
18. Consult with the Tenaris field service technical support group for thread compound requirements.
19. Direct contact with thread compound should be avoided. The use of gloves is recommended to prevent skin contacting the chemicals and heavy metals in the thread compound. The MSDS (Material Safety Data Sheet) shall be reviewed by anyone who may come into contact with thread compound. In addition, it is important to prevent the compound from spilling or dripping onto the ground which may cause environmental pollution.

Storage Compound

1. Storage compound protects the connection prior to the connection make-up.
2. Storage compound shall be applied to the entire connection instead of thread compound if the connection will not be made-up within one month.
3. The connections are susceptible to corrosion, scratches and other damages without proper storage compound.
4. Storage compound is intended to prevent corrosive damage to the connection and is distinctly different from thread compound.
5. ***Storage or drilling compound shall not be used for the make-up of any IPSCO connections.***

Stabbing Guide

1. The use of a stabbing guide is recommended for T&C connections and required for integral connections to ensure proper make-up of IPSCO connections.



2. The stabbing guide centralizes the pin in the box as the pin is lowered into the box. This prevents the pin face from contacting the box face and provides proper pin alignment into the box prior to thread engagement.
3. The stabbing guide reduces the risk of cross threading.
4. Damage to the connection face, threads and seals may occur if incorrect or improperly adjusted stabbing guides are used.
5. If the stabbing guide does not close easily on the box, the wrong or faulty stabbing guide may have been selected or a slight adjustment may be needed to ensure a proper fit.
6. Stabbing guides may or may not be interchangeable among different connections and among different weights within the same OD.

CONNECTION MAKE-UP

Connection Data Sheets

1. The most current Connection Data Sheets should be obtained from Tenaris prior to each run to ensure the most current information is available and applied. Please visit our website at <http://www.tenaris.com/ipscodatasheets/index.html>, or contact our Technical Sales department at premiumconnections@tenaris.com
2. The specified minimum make-up torque in the data sheet is the minimum torque to which the connection shall be assembled.
3. The specified optimum make-up torque in the data sheet should be used as the target make-up torque for best performance.
4. The specified maximum make-up torque in the data sheet should be used as the highest recommended make-up torque for normal operations.
5. The specified operating torque is the maximum allowable torque for downhole rotation.

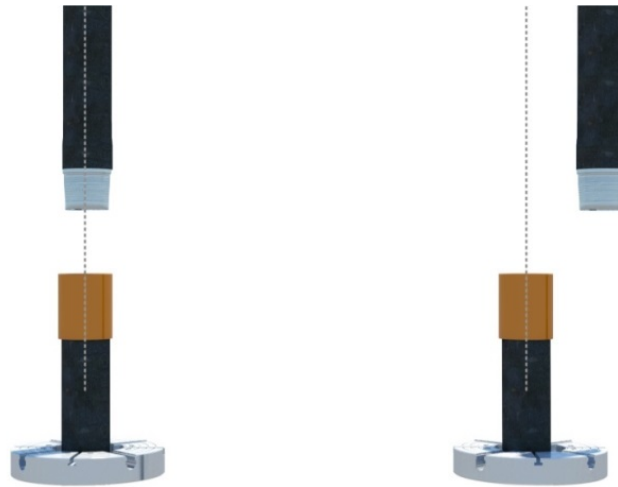
IPSCO Connections

1. Connections require connection-specific considerations during make-up.
2. Refer to applicable information; including thread compound application, make-up RPM, torque shoulder acceptable torque range, and downhole rotation capabilities for each connection:

- TORQ[®] SFW[®]
- TORQ[®] QXW[®]
- TORQ[®] DQW[®]
- ULTRA[™] SF & SFII
- ULTRA[™] FJ
- ULTRA[™] FX
- ULTRA[™] QX
- ULTRA[™] GX
- ULTRA[™] DQX & DQX-HT
- ULTRA[™] DQX-SR
- BPN
- BPN-SR

Stabbing

1. Remove the pin thread protector once the joint is on the rig floor.
2. Alignment shall be checked by ensuring that the center line of the pin is suspended over the centerline of the box.



3. Affix the stabbing guide to the connection box.
4. Verify that thread compound is appropriately applied per the specific connection Thread Compound Application section of the IPSCO RECOMMENDED FIELD.
5. A stabber, or a mechanical equivalent (i.e., PRS or CRT), in the derrick is recommended in order to maintain alignment of the connection during stabbing and to initiate make-up.
6. Slowly lower the pin into the box. Moving too quickly can cause loss of control of the pipe. If this happens, the pin threads and seal can be damaged and the joint may need to be laid down.
7. Remove the stabbing guide once the pin has been properly stabbed into the box. The elevators should be unlatched during make-up to allow the pipe to spin freely without interference.
8. Install a single joint compensator on 9-5/8" casing and larger for use during stabbing, make-up and break out. This will allow for the joint of pipe to be set down or removed slowly in a controlled manner.
9. A single joint compensator is recommended for 5" CRA pipe and larger.
10. If a connection is improperly stabbed, hoist the joint, re-inspect and stab again.

Make-up

1. Check that the power tongs will not contact the pin threads when moved into place before setting the jaws on the pipe.
2. The power tong's jaws should preferably be placed 6" or more above the end of pin.
3. For threaded & coupled connections, the back-up tongs should preferably be placed 6" or more below the box or alternatively on the lower half of the coupling for connections with a torque stop.
4. For integral connections, the back-up tongs should be placed 6" or more below the end of the box.
5. Initial rotation shall start in high gear with a low torque and high RPM. If the power tongs stall, back out the connection as that can be a sign of cross threading.
6. Strap wrenches or chain tongs can be used to assist in achieving initial thread engagement.
7. Once threads engage, high gear may be used at no higher RPM than the specified for that connection and nominal OD size on the Make-up RPM section of the specific guidelines for each connection.
8. If the threads do not properly engage, reverse the tong direction and slowly (0.5 RPM) rotate the pipe until the connection properly drops into place.
9. The joint shall be backed out completely if there is difficulty in achieving thread engagement.

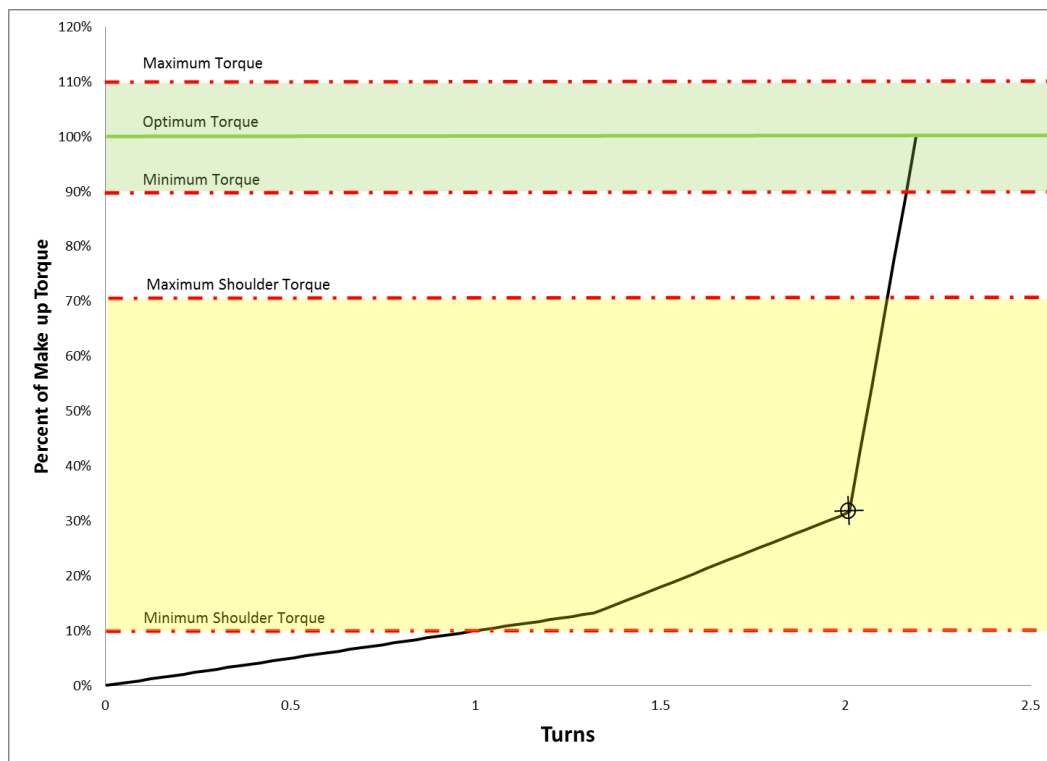
10. Switch to low gear at approximately 1,000 ft-lbs, before the seal engagement appears in the torque turn graph. Stopping and starting the connection should be avoided when the connection is near final position because static friction effects could lead to a misinterpretation of the final torque.
11. Refer to the Torque Shoulder section of the specific guidelines for each connection for proper torque turn graph.
12. Power tongs should remain in low gear and at a constant RPM once the seal engages.
13. Ensure that proper alignment is maintained during the make-up operation.
14. Monitor the torque turn system throughout the entire connection make-up. If there are any unexpected features on the torque turn graph, the make-up process should immediately be terminated, the connection broken out, cleaned and inspected.
15. After the make-up is complete, the graph should be reviewed to ensure that it has a clear torque shoulder, all required torque parameters are met and no unexpected features or anomalies are present.
16. The joint shall be laid down and replaced after a maximum of three unsuccessful attempts are made to make-up a connection. The box end on which the three make-up attempts were made shall be cleaned and inspected. The joint shall be pulled out and laid down if any damage to the thread or seal area is visible.

Break out

1. Ensure that the back-up tongs of appropriate size are used if disassembly of a connection is required.
2. Place the back-up tongs preferably in the lower half of the coupling and not on the pipe body for threaded & couple connections to ensure breaking out the field end pin.
3. If the back-up tongs are placed on the pipe body and the coupling starts to spin during break out, the break out process should be stopped and the back-up tongs of the appropriate size shall be placed on the lower half of the coupling.
4. Power tongs must be in low gear for break out. It is common for the break out torque to be higher than the make-up torque.
5. Slowly increase the torque until the connection begins to rotate counter clockwise.
6. The connection shall not be hammered to assist in the break out.
7. Continue rotating slowly at no higher than 8 RPM until the pin slightly “jumps” from the last engaged thread. This indicates that pin and box are no longer engaged and may be separated.
8. Stop rotating the pin once the pin “jump” occurs.
9. Install the stabbing guide prior to the “jump” of the pin when separating the two joints to prevent damage to pin and box.
10. Ensure that proper alignment is maintained during the break out operation.
11. In case of a re-run, clean, inspect, and apply an even coat of “dry moly” to the pin and box and allow it to dry. Dry moly is not required if the connection is phosphated. Otherwise, apply storage compound and clean thread protectors to box and pin.
12. Refer to the specific connection Field Repair section for field repair instructions.

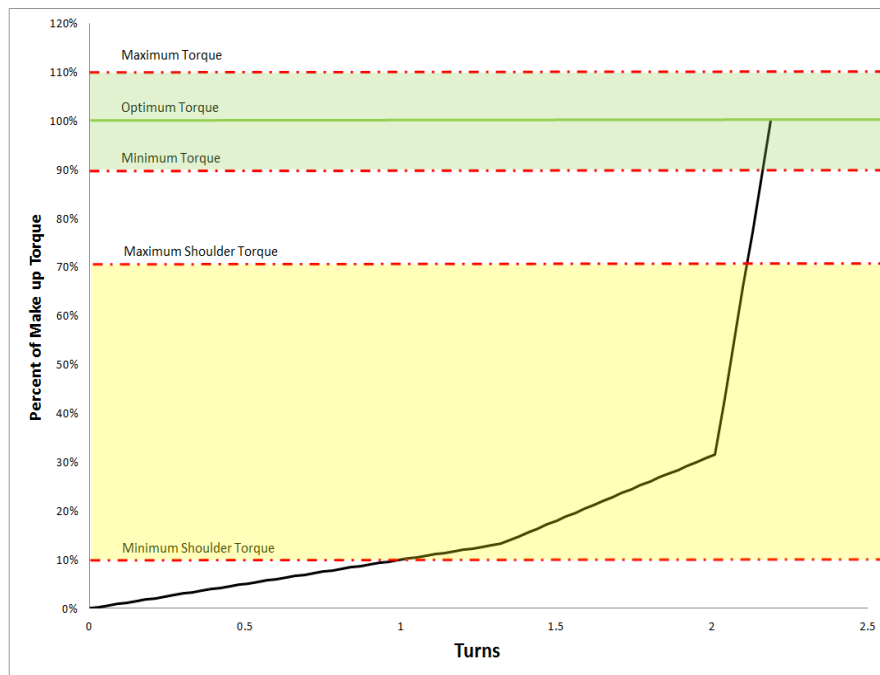
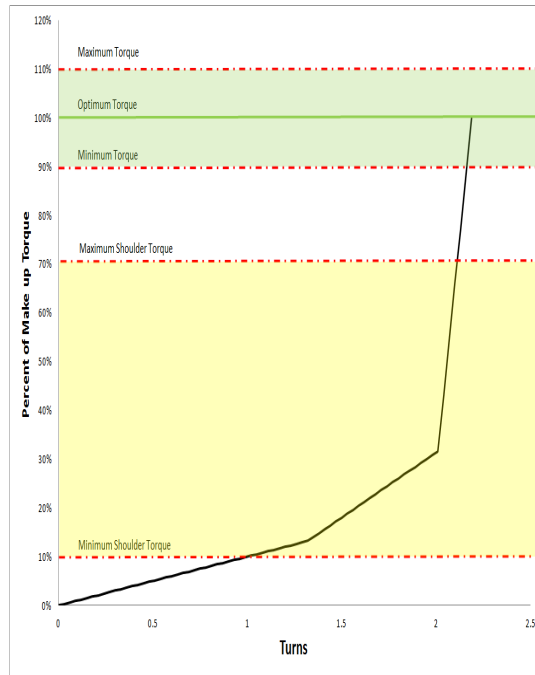
Torque Turn

1. Torque turn monitoring is required for assessing a proper make-up of IPSCO connections except for BPN and TORQ® DQW®.
2. Torque turn equipment provides evidence and enables the verification and recording of each connection make-up. It also aids in the recognition of any issues that may take place during the running of tubing or casing.
3. The initial turns of the makeup will have low torque due to thread interference starting to build up. The torque will increase at a faster rate when the seal engages. The torque will spike quickly when the torque shoulder is engaged causing the final torque to be reached.
4. Each connection will have a different graph and final make-up torque. The final make-up torque should be between the minimum and maximum make-up torque specified on the connection data sheet.
5. Different graphs are obtained due to threading tolerances, material properties, thread compound and other variables.
6. The graph requires showing the last section of the thread interference, transition to seal interference, torque shoulder and final torque.
7. A torque shoulder must be clearly visible for proper make-up.
8. The torque shoulder must be properly marked in the graph from proper calculation of delta turn and delta torque.
9. The operator must confirm the correct placement of the torque shoulder marking if the torque turn system uses automatic shoulder detection.
10. If any graph does not meet the acceptance criteria for the specific connection, the joint should be broken out, cleaned and inspected prior to a further make-up attempt.



11. The torque turn graph should provide the well name, connection name, size, weight, material grade, date, time, joint number, RPM, total turns, delta turn, shoulder torque, final torque and delta torque.

- 12. The delta turn is defined as the amount of turns past the torque shoulder contact.
- 13. The delta torque is defined as the amount of torque past the torque shoulder contact.
- 14. The scale of the graph can cause the make-up graph to look different. If it is stretched, it will look like more turns were made. If it is shortened, it will look like fewer turns were made.



- 15. In case of a re-run, each joint shall be labeled with the same tally number as the previous make-up attempt following by a hyphen or a period and the make-up attempt number to indicate that it is subsequent make-up of the same joint.
- 16. **Only competent personnel such as Field Service Technicians certified by Tenaris can validate acceptable torque turn graphs.**