Field Inspection Procedure for Used Performance Technology Plus Connections (PTECH+™) Revision 16

Definition of functional terms:
- **shall**: used to indicate that a provision is mandatory
- **should**: used to indicate that a provision is not mandatory, but recommended as good practice
- **may**: used to indicate that a provision is optional
- **can**: used for statements of possibility or capability
- **shall not**: used to indicate that a provision is not allowed, not permitted, not acceptable

1. **Scope**: The following procedure **shall** specify the equipment, inspection methods, and acceptance criteria for field inspection and repair of PTECH+™ connections. This inspection **shall** cover both visual and dimensional methods. This procedure supplements industry inspection practices and standards applicable to field inspection of rotary shouldered tool joint connections.

   This procedure is issued for general distribution, and therefore is not assigned or tracked to assure that all holders or recipients possess the current revision. The user of this document may verify that this document / procedure is the current revision by contacting TSC Drill Pipe (see §8).

2. **Definitions**:

   2.1. Damage(s): May include one or more of the following visually observed conditions:

   2.1.1 cuts and/or scratches

   2.1.2 dents and/or gouges and/or nicks

   2.1.3 fins / finning

   2.1.4 galling / shearing

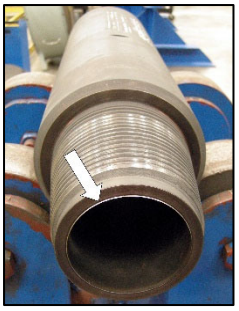
   2.1.5 pits / pitting

   2.1.6 wash-outs / erosion by fluid washing

   2.1.7 stretching / yielding as evidenced by significant deviation in thread lead measurement and box OD "swell" above the box counterbore

Example of galling

Seal face damage from Top Drive sub



Example of finning

   2.2 Thread Surfaces – includes stab flanks, thread crests (including crest radii), load flanks, and root radius

   2.3 Useful Tong Length – The length of the external diameter of the tool joint, measuring from the seal face and extending to a point that does not include (or is limited by) any raised diameter (including applied hardbanding).

3. **Equipment:** The equipment and documents listed below **shall** be required to perform these inspections. Note: All measuring equipment / tools shall be at the same temperature as the part to be measured, +/- 10˚F (+/- 4˚C)

   3.1. 12" (305 mm) Steel Rule graduated in 1/64" (0,39 mm)
   3.2. Approximately 6' (1,8 m) length Straight Edge
   3.3. Outside and Inside Diameter Spring Calipers
   3.4. Long Stroke Depth Micrometer
   3.5. Setting Standards for Depth Micrometer
   3.6. Profile Gage
   3.7. Lead Gage (with S165 Contact Points)

3.8. Lead Gage Standard
3.9. Dial Calipers
3.10 Pit Gauge
3.11 PTECH+™ Connection Field Inspection Dimension Drawing (current revision)
3.12 Flashlight (bright enough to be able to visually inspect 3 ft (0,9 m) into the end of the pipe)
3.13 Inspection mirror
3.14. 1/4" (6,4 mm) high stress stamp for 2-3/8" (60,3 mm) to 3-1/2" (88,9 mm) drill pipe
3.15. 3/8" (9,5 mm) high stress stamp for 4" and larger diameter drill pipe (101,6 mm)

4. **Preparation & Handling:** Care must be taken when handling the drill pipe to avoid damage to the connections. It is recommended that thread protectors are installed during the handling or movement of the drill pipe. Only remove the thread protectors after the pipe is laid on the inspection table / rack.

   All threads, and make-up shoulders, shall be cleaned sufficiently to allow for visual inspection. All surfaces being examined shall be cleaned so that foreign material does not interfere with the inspection process. The starting threads of the pin and box connections should be cleaned using a non-metallic wheel (a.k.a "soft wheel") or other similar buffing method.

5. **Sour Gas H2S service:** Any drill string elements suspected of being exposed to sour gas (H2S) shall be identified and/or segregated and be downgraded due to potential embrittlement.

6. Inspection, (including visual):

6.1. Straightness: All drill pipe shall be visually examined. The straightness of questionably bent pipes or crooked extremities shall be measured by one of the following methods:

- Straight-edge or taught string (wire) from one end of the pipe body to the other end of the pipe body; or
- Minimum 6 ft (1,8 m) straight edge shouldered on the pipe body surface beyond the extent of the hooked extremity, or an equivalent method.

6.1.1. In case of dispute, the straight-edge measurement shall govern.

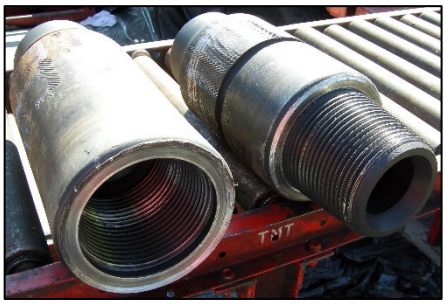
6.1.2. The chord or straight-edge shall be positioned to highlight the maximum deviation.

6.1.3. Deviation from the straight or chord height shall not exceed more than 3" (76,2 mm) over the entire length of the tube or 0.5" (12,7 mm) in the first 5 ft (1,5 m) from either end.

6.1.4. Drill pipe that does not meet the straightness requirements of §6.1.3 should be segregated and straightened in accord with a documented procedure.

6.2. Primary Make-up Shoulder (External Torque Shoulder): Refer to the "PTECH+™ Connection Field Inspection Dimension" drawing for terminology and shoulder locations. This shoulder surface should be free of damages (see §2.1) or other conditions that exceed the limits of paragraph 6.2.1. and 6.2.2. The connection shall be rejected or repaired if shoulder damage is present that would compromise connection sealing capability or connection performance.

6.2.1. Damage that does not exceed 1/32" (0,79 mm) in depth and crosses less than 30% of the radial width of the shoulder is acceptable. If the damage exceeds these limits, refacing shall be used to repair the shoulder surface. Filing or soft wheel buffing shall not be used to repair the face of the primary shoulder.

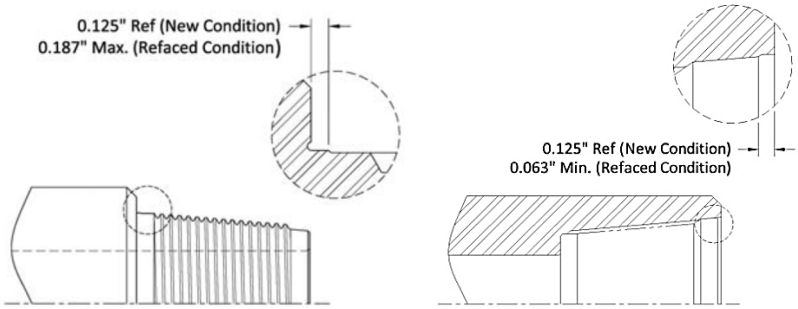


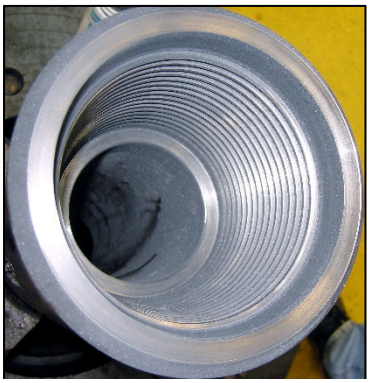
Example of seal face and thread damage

Example of seal face cut & protrusion

Example of stabbing damage on the seal face

6.2.2. The refacing repair should only remove enough material to repair the damage. A maximum of 1/32” (0,79 mm) of material may be removed during each refacing operation and a maximum of 1/16” (1,59 mm) may be removed from the connection before re-threading is required. After refacing repair, a minimum length of 0.063” (1,59 mm) shall remain on the box refacing benchmark, and 0.188” (4,76 mm) maximum shall remain on the pin refacing benchmark. (See Figures, below)





Example of clean threads & refaced shoulders

6.2.3. The refacing repair shall be performed by a refacing tool. The refacing tool shall be capable of refacing the seal shoulder and capable of refacing the torque shoulder.

6.3. Secondary Make-up Shoulder (Internal Torque Shoulder): The Secondary Shoulder is not a pressure sealing surface. Damage to this surface is not as critical unless the damage interferes with the connection make-up, ID drift test, or torque capacity of the connection. Dents, scratches, and cuts do not affect this surface unless these result in a raised surface or material protrusion.

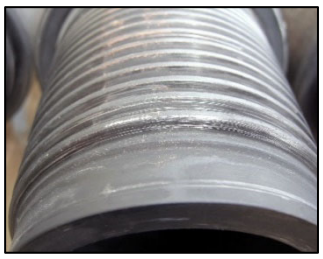
All raised surfaces and material protrusions shall be removed, and may be removed with a file. Copper Sulfate or other similar surface treatment shall be applied to repaired areas. A bevel of approximately 1/32” by 45˚ should be present on the full circumference of the internal edge of the box internal shoulder and the internal and external edge of the pin nose face.

The connection length shall be measured from the seal shoulder to the torque shoulder at a minimum of two distinct locations, preferably 180 degrees apart. Both measurements shall be within 0.002” of each other. Damage around the circumference of the shoulders and/or the face of the shoulders, to the extent that there is no position where the connection length can accurately be measured in two locations, is cause for rejection.

Additionally, the connection shall be rejected due to a reduction in the shoulder-to-shoulder length, in accord with the Field Inspection Drawing. Connection length readings shall not be measured in the plane of areas with unrepaired damages.

6.4. Threads: The stab flank to crest radius of the starting 4 to 5 threads of the pin and box connections may round off during break-in and normal operation. This condition is normal and does not affect the service of the connection. The remaining thread flank surfaces should be free of damage that exceeds 1/16" (1,59 mm) in depth or 1/8" (3,18 mm) in diameter. Thread roots should be free of damage that extends below the radius. Thread crests should be free of damage that would interfere with make-up. Material that protrudes beyond the thread profile should be removed using a round cornered triangle hand file or non-metallic wheel (a.k.a "soft wheel").

Example of first few threads stabbing damage



Pitting in the threads: (a) No pitting in the thread roots is permissible within a distance of 1.5 inches from the last "scratch" of the thread helix in either the box or the pin connection. When pitting in the thread roots does not conform to this requirement, the connection shall be repaired by rethreading. (b) Some pitting on the *remaining thread roots* ***is permissible*** only in conformance to the following *independent acceptance criteria*: (b1) Acceptable, when the presence of pitting is less than or equal to a linear distance of 1.5 inches on a single thread helix; (b2) Acceptable, when each individual pit is less than or equal to 1/32" in depth; and (b3) Acceptable, when each individual pit is less than or equal to 1/8" in diameter. When pitting conditions ***do not*** conform to one or more of these requirements the connection shall be repaired by rethreading.

6.5. Profile: The thread profile shall be verified along the full length of complete threads in two locations at least 90° apart. The profile gage should mesh evenly in the threads and show normal contact. If the profile gage does not mesh in the threads, lead measurements shall be taken to determine evidence of "stretch", (see also §7.1). Any evidence of thread "stretch" by the profile gauge or by the lead measurement(s) shall result in re-machining the threads (thread chasing or thread recut) to assure the thread form is in conformance to the requirements.

6.6. Hardbanding: The hardbanding area shall be visually inspected for height (typically not less than 1/32" (0,79 mm)) "raised". The hardbanding area shall also be visually inspected for cracking, spalling, chipping, flaking, and porosity (each condition should not be larger than 1/16" (1,59 mm). Each condition may be smaller than 1/16" (1,59 mm) but SHALL NOT occur more than 5 times in any 10 sq-in (64 cm^2) area. If these conditions are present during visual inspection the tool joint shall be dispositioned rejected.

6.7. Coating: Threads that are repaired by filing and shoulders that are repaired by refacing should be hot phosphate treated. Copper sulfate or C-Plate, when applied in small and limited areas, are also acceptable for treating these repaired surfaces.

6.8. Internal Coating: The Internal Plastic coating (IPC) shall be visually inspected with a flashlight for a distance inclusive of 3 feet (0,9 m) from the face of the Pin and Box connection, to identify damaged, torn, burned, or discolored coating, especially under the hardband area in the ID. Drill pipe with IPC damage shall be noted on the inspection report.

6.9. Visual inspection of serial number: The inspector, (or inspection company representative), shall determine from the owner (or user) of the pipe whether the pipe serial numbers shall be 100% legible with clarity as to which alpha character and/or number is stamped. If this requirement is confirmed, then:

6.9.1 If the Serial Number is not clearly identified then that specific pipe will be segregated and marked as a reject until the serial number can be established and the marking is made legible.

6.9.2 if a serial number is not legible, a TSC Drill Pipe representative shall be contacted to either (1) identify the missing characters in the existing serial number, or (2) issue a new serial number for the unidentified drill pipe; (see §8).

6.9.3 Depending on the size of the drill pipe, the appropriately sized high stress stamps shall be used for re-stamping the serial number on the 35-degree taper shoulder with the approved serial numbers submitted by a TSC Drill Pipe representative.

6.9.4 All serial numbers are to be documented onto the inspection report and correspond to the inspection condition of that specific joint of drill pipe. “N/A” is ***not*** acceptable as a serial number on the drill pipe, nor on the inspection report.

6.9.5 See also §7.10 for requirements regarding the marking (or re-marking) of the serial number on the pin connection cylinder diameter.

7. Dimensional Inspection:

7.1. Lead: The thread lead should be verified, if the profile gage indicates that thread stretch has occurred. The thread lead shall be measured over a 2” interval and shall not exceed 0.006” (0,15 mm). Connections failing this inspection should be inspected for cracks. If no cracks are found, then a complete re-thread process shall be performed. If cracks are found, the threaded connection may be rethreaded, assuring that the rethreading activity has removed all cracks by a suitable inspection method.

7.2. Box Outside Diameter: The outside diameter of the box shall be measured at a distance of 2” +/- 1/4” (50,8 mm +/- 6,35 mm) from the primary make-up shoulder. Measurements shall be taken around the circumference to determine the minimum diameter. This dimension shall be compared to the minimum diameter specified for the connection on the Connection Field Inspection Drawing, to determine acceptance or rejection.

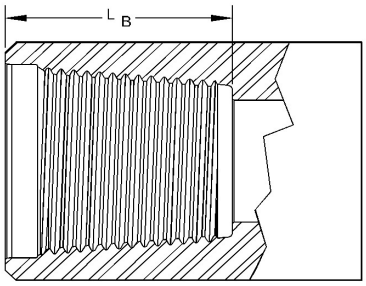
7.2.1 The current revision of the Field Inspection Drawing (and Field Inspection Procedure) may be obtained by download from www.drillpipe.com, or by contacting TSC Drill Pipe at +1-832-230-8211 or by email at mgarrett@drillpipe.com

7.3. Box Counterbore Diameter: The inside diameter of the box counterbore shall be measured in two locations, approximately 90˚ apart. Both measurements shall be equal to or smaller than the maximum counterbore diameter specified for the connection on the Connection Field Inspection Drawing. Connections that exceed the maximum counterbore diameter shall also be measured on the outside diameter in two locations, approximately 90˚ apart, at a location that is approximately 5/8” distance from the seal shoulder, to determine the condition of box OD swell. Connections that

exhibit box OD swell over the location of the box counterbore shall be repaired by rethreading, including refacing the connection seal face to a distance that removes the box OD swell over the location of the box counterbore. Connections that are non-conforming to the maximum counterbore diameter shall be repaired by rethreading.

7.4. Box Counterbore Wall Thickness: The wall thickness between the "Box Outside Diameter" and "Box Counterbore Diameter" shall be measured to inspect for concentricity. The frequency of measurement shall be sufficient to identify the minimum wall thickness in the region of the box counterbore. Connections that have a box counterbore wall thickness that is less than the specified minimum box counterbore wall thickness shall be repaired by rethreading.

7.5. Box Connection Length (L_B): The distance between the primary and secondary make-up shoulders shall be verified in two locations 180° apart. This distance shall be compared to the requirement on the Field Inspection drawing for the connection being inspected to determine acceptance or rejection.



7.5.1 Repair by Refacing: General Repair of connection length non-conformances may be accomplished as noted below:

7.5.1.1 Machine refacing in a CNC lathe is the preferred method. Where both external and internal torque shoulders are machined on the same setup, assuring axial and parallel alignment of the seal shoulder and the torque shoulder.

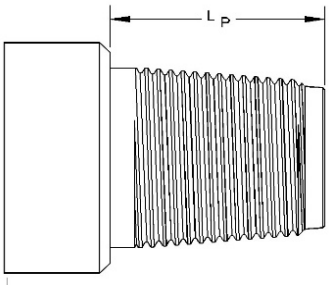
7.5.1.2 If the connection length exceeds the specified dimension, repair may be made by refacing the primary make-up shoulder. Refacing the primary make-up shoulder shall conform to the reface requirements of the benchmark; (see §6.2.2).

7.5.1.3 If the connection length is less than the specified dimension, refacing the secondary make-up shoulder may be adequate to repair this condition.

7.5.2 Repair of damage on shoulders shall conform to the reface requirements of the benchmark; (see §6.2.2).

7.6. Pin Nose Diameter: The outside diameter of the pin nose shall be verified. This dimension is not used to determine acceptance or rejection of the pin connection, but is to test for pin nose swell and also to verify the connection length. Pin nose swell shall be accepted only if the diameter of the pin nose swell conforms to the diameter tolerance of the pin nose feature as shown on the Field Inspection drawing.

7.7. Pin Connection Length (L_P): The distance between the primary and secondary makeup shoulders shall be verified in two locations 180° apart. This distance shall be compared to the requirement on the Field Inspection drawing for the connection being inspected to determine acceptance or rejection. (See §7.5.1. “Repair by Refacing”)



7.7.1. If the connection length exceeds the specified dimension, repair may be made by refacing the secondary make-up shoulder (pin nose).

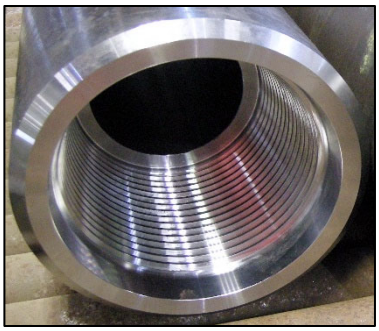
7.7.2. If the connection length is less than the specified dimension, refacing the primary make-up shoulder may be adequate to repair this condition. Refacing the primary make-up shoulder shall conform to the reface requirements of the benchmark; (see §6.2.2).

7.7.3. Repair of damage on shoulders shall conform to the reface requirements of the benchmark; (see §6.2.2).

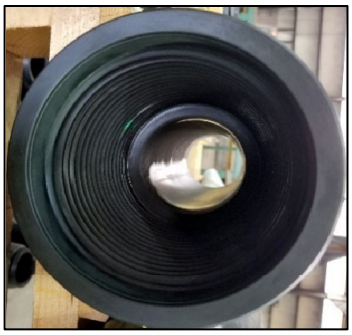
7.8. Tong Length: a minimum useful tong length (or space) requirement of 6" (152,4 mm) for pins and a minimum useful box tong length (or space) equal to the [connection length +2” (50,8 mm)] or 7" (177,8 mm) minimum, whichever is greater.

7.9. Re-threading: After field repair has been completed, and the connection fails to meet the inspection acceptance requirements, then re-threading shall be the required repair method. Performance of re-threading may not require complete removal of the thread profile if sufficient material can be removed by thread chasing to comply with the new product requirements. The connection does not have to be “re-blanked”, however both the seal shoulder and the torque shoulder, and all thread surfaces (reference §2.2) must be machined to 100% “new metal”. Machining to “new metal” is not required for cylindrical diameters.

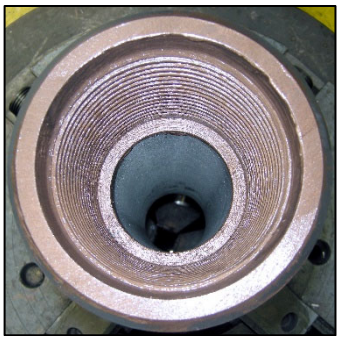
After completion of re-threading, the connection should be hot phosphate treated, (See Addendum A for alternate treatment). A make & break procedure is recommended, but not required on re-threaded connections, ***after*** the hot phosphate treatment. A make & break procedure may be obtained from TSC Drill Pipe upon request.



Example of good re-threading

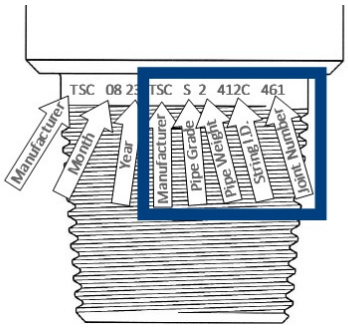


Example of good hot phosphate treatment



Example of good thread compound application

7.10 Re-applying Pin Markings: After field repair has been completed, (including rethreading or thread "chasing" as needed), the pin markings shall be legible. If the pin markings were removed, or are not legible, the markings shall be re-applied in a method, size, style, and orientation compatible with the original markings. These markings provide the product identification which link to the manufacturing records. Only the markings enclosed in the box in the diagram below are required to be re-applied. An example of pin markings is shown:



8. Please contact TSC Drill Pipe with any questions: +1 832-230-8211 or mgarrett@drillpipe.com.

9. Optional Inspection Methods

9.1 Magnetic Particle Inspection: Magnetic Particle Inspection (MPI) of the tool joint and the threaded connection may be required by the customer. When required, the inspection shall be performed in accordance with a procedure and in conformance with the customer requirements.

9.2 It is a good practice to MPI inspect connections that exhibit "stretched" threads to identify any cracks in the threaded areas.

Addendum A
Alternate Thread Surface Treatment After Rethreading (Copper Sulfate)

In §7.9, (Re-Threading), is stated "…the connection should be hot phosphate treated…". Hot phosphate treatment results in an exceptional surface condition that is resistant to corrosion and provides for good adhesion of the thread compound.

Alternately, for thread repair facilities and thread repair companies that do not have reasonable access to hot phosphate treatment, TSC Drill Pipe allows a treatment of copper sulfate as a substitute **ONLY when the [owner / manager] of the drill pipe AND the [owner / manager] of the repair facility agree to have copper sulfate applied, and applied in conformance with this procedure, as prescribed in this Addendum A**.

Copper sulfate, as a substitute for hot phosphate, shall be applied in accord with the following instructions.

NOTE: This procedure does not apply to spot treatment of copper sulfate to connections that have been repaired by filing or buffing, (see §6.7). This procedure is intended to provide for an application of copper sulfate on the entirety of a clean, "new" metal surface, that includes the threads, the seal

shoulder, and the torque shoulder.

Generally, (1) the copper sulfate shall be mixed in adherence to the instructions; and (2) the threaded connection shall be “clean”, non-oily, and dry, and shall not exhibit any surface corrosion or other substances on surfaces that will receive the application of the copper sulfate; and (3) the copper sulfate shall be applied in the manner and method prescribed in this procedure. The application of the copper sulfate shall be performed in conformance to local safety guidelines, and in conformance to the guidelines that are provided with the chemicals and materials, and in conformance with the recommended PPE, (Personal Protective Equipment).

Copper Sulfate Application

Suggested PPE and other supplies, (actual PPE shall be determined by the organization management) :

- Goggles for eye protection
- Latex or Nitrile gloves for hand protection
- Clear, acid resistant, face mask for splash protection
- Lab coat, PVC Apron, or long sleeve clothing to protect from splashes
- Baking Soda
- 1-quart heavy duty plastic (or PVC) spray container

Ingredients for Copper Sulfate Solution:

- 98% solution H_2SO_4 Sulfuric Acid
- $CuSO_4$ Cupric Sulfate Crystal
- Distilled Water

WARNINGS:

* Sulfuric acid is highly corrosive. Care should be taken to prevent spills and splashing.
* If you get sulfuric acid on your skin, immediately flush with soap and cool water for at least 15 min and seek medical attention.
* If you splash sulfuric acid on your eyes, flush your eyes continuously with cool water for at least 15 minutes and seek medical attention.
* If sulfuric acid is spilled on a surface, cover the spill with baking soda. Wait for the bubbling to stop then carefully wipe all affected areas with a sponge or paper towels and dispose of properly.
* Use glass or PVC products for containment, as sulfuric acid will dissolve most other products.
* Proper PPE should be used when handling sulfuric acid and copper sulfate.
* Mixing the product or applying the product should be done in a well-ventilated area.

Mixing the Solution:

(A) Place 4 heaping tablespoons of Cupric Sulfate Crystal (also known as copper sulfate pentahydrate or blue vitriol) into the 1-quart heavy duty plastic spray container to be used to dispense solution.
(B) Fill the 1-quart heavy duty plastic spray container 2/3 full with distilled water and shake to dissolve the blue crystals.

(C) Once all of the crystals have dissolved add about 3 tablespoons of sulfuric acid into container and shake solution thoroughly. **NOTE and CAUTION:** The acid shall be poured slowly into the water solution. **DO NOT**

pour water into the acid solution.

Preparation:
Before applying the solution, the surface of the connection (threads and shoulders) shall be clean, dry, and free from oils or other contaminants. Denatured alcohol is a suitable solvent for removing oils. NOTE: The denatured alcohol must have fully evaporated from the surface and the surface treated with the denatured alcohol shall be wiped clean. If the part is wet, oily, or dirty, these conditions will interfere with the desired etching of part by the copper sulfate.

Application:
(1) Ensure proper PPE such as clothing, goggles, gloves and mask are being used in a well-ventilated area.
(2) Set the spray bottle nozzle to apply a mist (not a stream), and spray the copper sulphate sparingly onto a clean rag. Do not spray the copper sulfate solution directly onto the thread & shoulder surfaces.
(3) Rub the copper sulfate dampened rag back and forth on the surfaces to be treated, assuring the entirety of the surface is treated. Very quickly, you will notice a copper appearance on the surface of the metal being treated.
(4) Continue rubbing the solution throughout the area. The application will begin to appear dark as the rag begins to build up with small dark "flakes", (the appearance may be similar to the appearance of dirt).
(5) Apply the solution to a clean part of the rag and continue the rubbing process until all surfaces to be treated have an even and bright copper appearance. The quality and durability of the copper sulfate application requires a consistent and thorough application process.

Post Application:
After all treated surfaces display an even and bright copper appearance, allow the surfaces to dry thoroughly. Drying time will depend on environmental factors including humidity and temperature. For moderate humidity in a temperature of about 75 degrees F, the drying time will be approximately 30 minutes. Lower humidity and warmer temperatures will result in a faster drying time. When the treated surfaces are dry, then oil or thread compound may be applied to the threaded surfaces and shoulders. Applying the oil or thread compound to the surfaces PRIOR to complete drying will result in degrading the copper sulfate application.

Revision History: Field Inspection Procedure for Used Performance Technology Plus Connections™ (PTECH+™) Revision 16

Revision 12 Effective date is September 01, 2023
Added §6.9.5 – Reference to pin cylinder diameter markings
Added §7.10 – "Reapplying Pin Markings"
Added §Addendum A – "Alternate Thread Surface Treatment After Rethreading (Copper Sulfate)"

Revision 13 Effective date is October 11, 2023
Revised §7.6 – "Pin Nose Diameter"

Revision 14 Effective date is June 10, 2024
Revised §7.3 – "Box Counterbore Diameter" and §7.4 – "Box Counterbore Wall Thickness"

Was: "7.3. Box Counterbore Diameter: The inside diameter of the box counterbore shall be measured. This dimension is not used to determine acceptance or rejection, but is used to test for box swell and also used to verify box connection length."

Is: "7.3. Box Counterbore Diameter: The inside diameter of the box counterbore shall be measured in two locations, approximately 90˚ apart. Both measurements shall be equal to or smaller than the maximum counterbore diameter specified for the connection on the

Connection Field Inspection Drawing. Connections that exceed the maximum counterbore diameter shall also be measured on the outside diameter in two locations, approximately 90˚ apart, at a location that is approximately 5/8" distance from the seal shoulder, to determine the condition of box OD swell. Connections that exhibit box OD swell over the location of the box counterbore shall be repaired by rethreading, including refacing the connection seal face to a distance that removes the box OD swell over the location of the box counterbore. Connections that are non-conforming to the maximum counterbore diameter shall be repaired by rethreading."

Was: "7.4. Box Counterbore Wall Thickness: The wall thickness between the "Box Outside Diameter" and "Box Counterbore Diameter" shall be measured to inspect for concentricity. The frequency of measurement shall be sufficient to identify the minimum wall in the region of the counterbore. The "Box Outside Diameter" and "Box Counterbore Diameter" shall also be measured to assure that it is greater than the minimum specified dimension for the connection being inspected; (reference the Field Inspection Drawing for Box Counterbore requirements)."

Is: "7.4. "Box Counterbore Wall Thickness: The wall thickness between the "Box Outside Diameter" and "Box Counterbore Diameter" shall be measured to inspect for concentricity. The frequency of measurement shall be sufficient to identify the minimum wall thickness in the region of the box counterbore. Connections that have a box counterbore wall thickness that is less than the specified minimum box counterbore wall thickness shall be repaired by rethreading."

Revision 15 Effective date is April 04, 2025

Added: "This procedure supplements industry inspection practices and standards applicable to field inspection of rotary shouldered tool joint connections." to §1 – Scope

Added: "Approximately" to §3.2

Added: "The connection shall be rejected or repaired if shoulder damage is present that would compromise connection sealing capability or connection performance." to §6.2

REVISED:

WAS: §6.3 Secondary Make-up Shoulder (Internal Torque Shoulder): The Secondary Shoulder is not a pressure sealing surface. Damage to this surface is not as critical unless the damage interferes with the connection make-up, ID drift test, or torque capacity of the connection. Dents, scratches, and cuts do not affect this surface unless these exceed 50% of the radial width of the secondary shoulder and result in the connection to be rejected due to a reduction in the shoulder-to-shoulder length. Filing may be used to remove material protrusions, which extend from the face of the secondary shoulder. Connection length readings shall not be measured in damaged areas.

IS: §6.3 Secondary Make-up Shoulder (Internal Torque Shoulder): The Secondary Shoulder is not a pressure sealing surface. Damage to this surface is not as critical unless the damage interferes with the connection make-up, ID drift test, or torque capacity of the connection. Dents, scratches, and cuts do not affect this surface unless these result in a

raised surface or material protrusion.

All raised surfaces and material protrusions shall be removed, and may be removed with a file. Copper Sulfate or other similar surface treatment shall be applied to repaired areas. A bevel of approximately 1/32" by 45˚ should be present on the full circumference of the internal edge of the box internal shoulder and the internal and external edge of the pin nose face.

The connection length shall be measured from the seal shoulder to the torque shoulder at a minimum of two distinct locations, preferably 180 degrees apart. Both measurements shall be within 0.002" of each other. Damage around the circumference of the shoulders and/or the face of the shoulders, to the extent that there is no position where the connection length can accurately be measured in two locations, is cause for rejection.

Additionally, the connection shall be rejected due to a reduction in the shoulder-to-shoulder length, in accord with the Field Inspection Drawing. Connection length readings shall not be measured in the plane of damaged areas.

Revision 16 Effective date is July 08, 2025

Added: "§6.4 Pitting in the threads: (a) No pitting in the thread roots is permissible within a distance of 1.5 inches from the last "scratch" of the thread helix in either the box or the pin connection. When pitting in the thread roots does not conform to this requirement, the connection shall be repaired by rethreading. (b) Some pitting on the remaining thread roots is permissible only in conformance to the following independent acceptance criteria: (b1) Acceptable, when the presence of pitting is less than or equal to a linear distance of 1.5 inches on a single thread helix; (b2) Acceptable, when each individual pit is less than or equal to 1/32" in depth; and (b3) Acceptable, when each individual pit is less than or equal to 1/8" in diameter. When pitting conditions do not conform to one or more of these requirements the connection shall be repaired by rethreading.

Revised (Addendum A): Alternately, for thread repair facilities and thread repair companies that do not have reasonable access to hot phosphate treatment, TSC Drill Pipe ~~**approves**~~ **allows** a treatment of copper sulfate as a substitute ONLY when the [owner / manager] of the drill pipe AND the [owner / manager] of the repair facility agree to have copper sulfate applied, and applied in conformance with this procedure, as prescribed in this Addendum A.