



**TURKISH  
PETROLEUM**

**TECHNICAL SPECIFICATION &  
MANUFACTURING REQUIREMENTS FOR API  
CASING (J55, N80Q, P110 GRADE) Rev.1.8**

2026

TURKISH PETROLEUM CORPORATION

ENGINEERING DEPARTMENT

## GRADE-J55 SEAMLESS TECHNICAL SPECIFICATION

1. This specification is prepared for J55 Casing requirement of TPAO. The specifications of API 5CT and API 5B are valid as well even if it is not mentioned here.
2. The Contractor is responsible for the supply and compliance of all offered materials. If not the direct manufacturer, it shall provide documentation evidencing its authorized relationship with the manufacturer. All production processes shall be completed by the same manufacturer qualified in accordance with API 5CT and API 5B latest editions.

Specification	Requirement
<b>Reference Documents:</b> ISO 13679/ API RP 5C5 latest edition API Specification 5CT latest edition API Spec 5B latest edition API RP 5A3 latest edition	Procedure for testing casing and tubing connections. Specification for casing and tubing. Specification for Threading, Gauging and Thread Inspection of Casing, Tubing, and Line Pipe Threads. Recommended practice on thread compound for casing, tubing and line pipe.
<b>Process of Manufacture</b>	Cold-drawn tubular products without appropriate heat treatment are not acceptable. Casing and accessory material for casing shall be seamless (API 5CT Latest Edition).
<b>Supplementary Requirements (SR)</b>	SR2 and SR16 are required accept for 20".
<b>Material</b>	As per API Spec 5CT Latest Edition Table E.4 (Chemical Composition, (mass fraction %): Pmax. 0.030%, Smax. 0.030%). Chemical composition and percentage of all elements in steel shall be presented. All materials shall be certificated.
<b>Heat Treatment</b>	All J55 casings shall be full body full-length normalized or normalized and tempered (API 5CT Latest Edition Table E.3).
<b>Length</b>	Range 3: Min 10,36 m, Max 12,80 m (API 5CT Latest Edition Table C.22). <b>Special Range 3: Min 10,36 m, Max 12,80 m.</b>
<b>Traceability</b>	All necessary procedures to maintain heat and lot identity shall be established and followed, pipes or lots shall be uniquely numbered in the order they are heat treated (API 5CT Latest Edition 5.4).
<b>Tensile and Hardness</b>	Total elongation under load (%)= 0.5 Yield Strength (Mpa)= min. 379 - max. 552 Tensile Strength (Mpa)= min. 517 (API 5CT Table C.5).  The frequency of hardness testing shall be as per API Spec 5CT Latest Edition. The frequency of tensile testing for casing shall be performed as per API 5CT Latest Edition Table C.32.
<b>CVN Testing</b>	Charpy V-notch tests shall be carried out in accordance with A.9 (SR16).  The minimum full-size transverse CVN absorbed energy requirement, Cv, is 20 J (15 ft-lb) for all wall thicknesses. The minimum full-size longitudinal CVN absorbed energy requirement, Cv, is 27 J (20 ft-lb) for all wall thicknesses. (API 5CT Latest Edition 6.4.3).  The frequency of CVN testing for casing shall be performed as per API 5CT Latest Edition Table C.16.
<b>Processing of pin and box ends</b>	Pin and box threads shall be abrasive-blasted, unless processed by any appropriate technique (like CNC Machine), including the threading process, which has been agreed between the purchaser and manufacturer to be sufficient to avoid the presence of material susceptible to detaching or causing galling during make-up. It is sufficient that the inside and outside edges of the ends of all products are free from burrs.
<b>Wall thickness (t)</b>	Wall thickness shall be measured over the full body, with a minimum coverage of 25 % of the surface area covered by the automatic system. The minimum measured wall thickness for each pipe shall be recorded.  Wall thickness tolerance for pipe is -12.5 %*t as indicated in API 5CT Latest Edition 7.11.2.  Each length of pipe, coupling stock, coupling material or accessory material shall be measured to verify conformance with wall thickness requirements. Wall thickness measurements shall be made with a mechanical calliper, a go/no-go gauge or with a properly calibrated NDE device of appropriate accuracy. API 5CT Latest Edition 9.13.4.  PS: The wall thickness will be selected from Table C.1 according to the required outside diameter of casing.

<b>Non-destructive examination (NDE)</b>	<p>All pipe and couplings that require NDE (except visual inspection) shall be inspected full-body, full-length for defects.</p> <p>All pipe shall be inspected for the detection of imperfections on the outside and inside surfaces by one or more of the following methods:</p> <p>a) ultrasonic testing to acceptance level as specified in Table C.38 or Table E.38 in accordance with ISO 10893-10 or ASTM E213;</p> <p>b) flux leakage testing to acceptance level as specified in Table C.38 or Table E.38 in accordance with ISO 10893-3 or ASTM E570;</p> <p>c) eddy current concentric coil testing to acceptance level as specified in Table C.38 or Table E.38 in accordance with ISO 10893-2 or ASTM E309;</p> <p>d) for pipe outside surface, magnetic particle inspection in accordance with ISO 10893-5 or ASTM E3024. (API 5CT Latest Edition 9.15).</p>									
<b>NDE of coupling stock</b>	<p>Coupling stock for couplings that will be fully machined may have imperfections on the unmachined surfaces, however the final machined surfaces shall meet the specified dimensions and surface inspection criteria related to API 5CT Latest Edition 9.15.11.</p> <p>Couplings shall be manufactured from coupling material and NDE shall be performed after production.</p>									
<b>Hydrostatic Testing</b>	<p>Each length of pipe shall be tested full-length subsequent to final heat treatment to at least the hydrostatic pressure specified in equation below without leakage. The test conditions shall be held for not less than 5 s at full pressure.</p> $\text{Test Pressure} = [2 * f * Y_{Smin} \cdot (\text{MPa}) * \text{wall thickness}(\text{mm})] / \text{Outside diameter} (\text{mm})$ <p>f is a factor: 0.6 (0.6) for Grades H40, J55, and K55 larger than Label 1: 9 5/8 or 0.8 (0.8) for all other grades and sizes.</p> <p>All pipes shall be hydrostatically tested according to API 5CT Latest Edition 9.12. If the calculated test pressure exceeds 10000 psi, test will be performed at 10000 psi.</p>									
<b>Dimensional Testing</b>	<p>For pipe, coupling stock, coupling material and accessory material, the manufacturer shall demonstrate conformance to the requirements of 7.3.2.</p> <p>For non-upset pipe, coupling stock, coupling material and accessory material, the measurements shall be made with pi-tapes (wrap tapes), micrometers, callipers or snap gauges.</p> <p>The manufacturer shall measure the diameter of both ends of pipe ordered as plain-end, coupling stock or coupling material.</p> <p>Dimensional checks shall be applied to all pipes and couplings as per API 5CT Latest Edition 9.13.2</p>									
<b>Outside Diameter Tolerances</b>	<p>The following tolerances apply to the outside diameter, D, of pipe:</p> $D < 4\text{-}1/2 = \pm 0.79\text{mm} (\pm 0.031 \text{ in.})$ $D \geq 4\text{-}1/2 = +1\%D ; -0.5\%D$ <p>As per API 5CT Latest Edition 7.11.1.</p>									
<b>Straightness</b>	<p>Deviation from straight, or chord height, shall not exceed 24 mm for each pipe as per API 5CT Latest Edition 7.9 (see API 5CT Annex Figure D.13 and Figure D.14).</p> <p>Straightness Evaluation shall be performed according to API 5CT Latest Edition 9.13.8.</p> <p>The frequency of testing for casing shall be four per lot. Maximum number of pieces in a lot shall be 100.</p>									
<b>Drift Testing</b>	<p>Each length of pipe either threaded or plain-end shall be drift-tested throughout its entire length.</p> <p>D: Outside Diameter, d: Inside Diameter</p> <p>Casing :</p> <table border="0" data-bbox="475 1877 1075 1966"> <tr> <td>D &lt; 9-5/8"</td> <td>Drift L=6inches</td> <td>Drift D= d-1/8"</td> </tr> <tr> <td>D ≥ 9-5/8" to ≤ 13-3/8"</td> <td>Drift L=12inches</td> <td>Drift D= d-5/32"</td> </tr> <tr> <td>D &gt; 13-3/8"</td> <td>Drift L=12inches</td> <td>Drift D= d-3/16"</td> </tr> </table> <p>All the pipes shall be drifted as per API 5CT Table E.23.</p>	D < 9-5/8"	Drift L=6inches	Drift D= d-1/8"	D ≥ 9-5/8" to ≤ 13-3/8"	Drift L=12inches	Drift D= d-5/32"	D > 13-3/8"	Drift L=12inches	Drift D= d-3/16"
D < 9-5/8"	Drift L=6inches	Drift D= d-1/8"								
D ≥ 9-5/8" to ≤ 13-3/8"	Drift L=12inches	Drift D= d-5/32"								
D > 13-3/8"	Drift L=12inches	Drift D= d-3/16"								
<b>Linear Imperfections</b>	<p>External an internal max. permissible depth of linear imperfections shall be according to API 5CT Latest Edition Table E.25—Maximum Permissible Depth of Linear Imperfections</p>									
<b>Threading</b>	<p>Product threads, gauging practice and thread inspection shall conform to the requirements of API Spec 5B Latest Edition.</p>									

<b>Anti-Galling Treatment</b>	Coating on the couplings thread shall be coated with manganese phosphate or other phosphate coating.
<b>End Finishing</b>	<p>External coating (mill varnish) shall be applied to each pipe for protection from weathering and corrosive effects.</p> <p>Pipe and couplings shall be given an external coating for protection from rust while in transit. An attempt should be made to make these coatings smooth, hard to the touch and with minimum sags. The coating shall be rated to protect the pipe for at least six months as per API 5CT Latest Edition 11.1.1 &amp; 11.1.2.</p>
<b>Certification</b>	<p>The manufacturer shall furnish to the purchaser a certificate of compliance stating that the material has been manufactured, sampled, tested and inspected in accordance with this Contract and has been found to meet the requirements.</p> <p>Test data and test conditions for impact, hardness and tensile tests (include elongation value), hydrostatic test pressure and duration, chemical analysis, test data for all diameter, wall thickness, grade, process of manufacture and type of heat treatment (include heat treatment temperature and duration) shall be specified. Results of all tests, ISO certificates shall be available as well as mill test certificate (MTC) and certificate of origin (CO).</p> <p>As per API 5CT Latest Edition 12.2 &amp; 12.3.</p>
<b>Marking</b>	<p>Stenciling or a combination of stenciling and stamping as per API Spec 5CT Latest Edition 11.</p> <p>Marking of each pipe shall contain the following; manufacturer's name or mark, customer's name or mark (TPAO), API license, purchase order number, date of manufacture, outer diameter (OD, inches), mass designation, grade, process of manufacture, length, type of thread, heat treatment and supplementary requirements. API monogram is mandatory for each pipe.</p> <p>We shall to ensure that clear differentiation of casings for example 13 3/8" pipes with different lb/ft values (exp. 54.5, 61, 68 and 72), the protective caps and markings/labelling must be painted with different colors. So that we can easy to distinguish the different wall thickness before the shipment of casings.</p> <p>Labeling should be done as shown in the examples below.</p> <p>The marking on the casing should include the short description specified in the order item. For example, "7" 26LB/FT N80Q LTC CASING.</p> <p>Example of Casing Labeling: Company Name API 5CT-xxxx CASING 9 5/8" 43.5LB/FT N80Q LTC Heat No.xxx Lot No.xxx Pipe No.xxx Length xx meter TPAO Tender No.xxxxxx Order No.xxxxxx Date of manufacture xxxx</p> <p>Example of Coupling Labeling: Company Name API 5CT-xxxx CASING COUPLING, 7" 26 LB/FT N-80Q LTC TPAO Tender No.xxxxxxx</p> <p>(In addition to this all diameters shall in accordance with inch)</p> <p>All markings shall be applied using the in English language.</p>
<b>Thread Protector &amp; Thread Compound</b>	<p>The entity performing the threading shall apply external and internal thread protectors of such design, material and mechanical strength to protect the thread and end of the pipe from damage under normal handling and transportation and to inhibit infiltration of dust and water to the threads during transportation and normal storage period. Normal storage period shall be considered as approximately one year. UV light resistant, closed ended protectors with a small ventilation hole shall be made up properly to box and pin ends immediately after final inspection. API modified thread compound in accordance with API RP 5A3 shall be applied to threads prior to making up thread protectors. Supplied protectors shall be compliant to API 5CT Annex F ("Requirements for Thread Protector Design and Validation"). Casing thread protector should be suitable for pipe hook implementation.</p> <p>Protector shall be used on both sides of the coupling for protection, and also separately requested couplings shall be packed in wooden boxes. It is important that the sleeves have a cover protector at both ends. Corrosion is observed due to our storage conditions.</p> <p>Steel-plastic composite protectors shall be used on 20" Casings.</p>
<b>Packaging</b>	For delivery term other than DAP, the terms of the attached packaging specification shall apply (Packaging Technical Specification For Casing, Tubing and Accessories)
<b>Inspection &amp; Rejection</b>	<p>Material which shows defects on inspection or subsequent to acceptance at manufacturer's works, or which proves defective when properly applied in service, may be rejected, and the manufacturer so notified. If tests that require the destruction of material are made, any product which is proven not to meet the requirements of this Standard shall be rejected. Disposition of rejected product shall be under manufacturer's responsibility as per API 5CT Latest Edition Annex B.4.</p> <p>Manufacturer will prepare and propose the inspection and Test Plan (ITP) or Quality Control Plan (QCP), including all manufacturing processes, tests (tensile testing, mechanical testing, hydrostatic testing, drift testing, nondestructive examination (NDE) et.) and the points that the sides (TPAO and manufacturer) engage in, according to technical specifications. Manufacturing will be started after ITP or QCP approved by TPAO.</p> <p>TPAO will be able to control any stages of manufacturing. If any discrepancy according to technical specification is detected, TPAO has rights of interfering and stopping the production.</p> <p>If TPAO asks for 3rd party inspection, all products shall be inspected by 3rd party inspection company. The inspector company shall be designated with the approval of TPAO. TPI cost shall be paid by TPAO.</p>

## GRADE-J55 ERW TECHNICAL SPECIFICATION

1. This specification is prepared for J55 Casing requirement of TPAO. The specifications of API 5CT and API 5B are valid as well even if it is not mentioned here.
2. The Contractor is responsible for the supply and compliance of all offered materials. If not the direct manufacturer, it shall provide documentation evidencing its authorized relationship with the manufacturer. All production processes shall be completed by the same manufacturer qualified in accordance with API 5CT and API 5B latest editions.

Specification	Requirement
<b>Reference Documents:</b> ISO 13679/ API RP 5C5 latest edition API Specification 5CT latest edition API Spec 5B latest edition API RP 5A3 latest edition	Procedure for testing casing and tubing connections. Specification for casing and tubing. Specification for Threading, Gauging and Thread Inspection of Casing, Tubing, and Line Pipe Threads. Recommended practice on thread compound for casing, tubing and line pipe.
<b>Supplementary Requirements (SR)</b>	SR40 is required.
<b>Material</b>	As per API Spec 5CT Latest Edition Table E.4 (Chemical Composition, (mass fraction %): Pmax. 0.030%, Smax. 0.030%). Chemical composition and percentage of all elements in steel shall be presented. All materials shall be certificated.
<b>Length</b>	Range 3: Min 10,36 m, Max 12,80 m (API 5CT Latest Edition Table C.22). <b>Special Range 3: Min 10,36 m, Max 12,80 m.</b>
<b>Heat Treatment</b>	All J55 casings shall be full body full-length normalized or normalized and tempered on weld seam. (API 5CT Latest Edition Table E.3)
<b>Traceability</b>	All necessary procedures to maintain heat and lot identity shall be established and followed, pipes or lots shall be uniquely numbered in the order they are heat treated (API 5CT Latest Edition 5.4).
<b>Tensile and Hardness</b>	Total elongation under load (%) = 0.5 Yield Strength (Mpa) = min. 379 - max. 552 Tensile Strength (Mpa) = min. 517 (API 5CT Latest Edition Table C.5).  The frequency of hardness testing shall be as per API Spec 5CT Latest Edition. The frequency of tensile testing for casing shall be performed as per API 5CT Latest Edition Table C.32.
<b>Processing of pin and box ends</b>	Pin and box threads shall be abrasive-blasted, unless processed by any appropriate technique (like CNC Machine), including the threading process, which has been agreed between the purchaser and manufacturer to be sufficient to avoid the presence of material susceptible to detaching or causing galling during make-up. It is sufficient that the inside and outside edges of the ends of all products are free from burrs.
<b>Metallographic evaluation for EW pipe</b>	A metallographic evaluation shall be performed at the beginning of the welding process for each size of tubular, at least every 4 h during the welding and after any substantial interruption of the welding process. The samples shall be obtained prior to heat treatment as per API 5CT Latest Edition 9.11.
<b>Wall thickness (t)</b>	Wall thickness shall be measured over the full body, with a minimum coverage of 25 % of the surface area covered by the automatic system. The minimum measured wall thickness for each pipe shall be recorded.  Wall thickness tolerance for pipe is $-12.5 \% * t$ as indicated in API 5CT Latest Edition 7.11.2.  Each length of pipe, coupling stock, coupling material or accessory material shall be measured to verify conformance with wall thickness requirements. Wall thickness measurements shall be made with a mechanical calliper, a go/no-go gauge or with a properly calibrated NDE device of appropriate accuracy. API 5CT Latest Edition 9.13.4.  PS: The wall thickness will be selected from Table C.1 according to the required outside diameter of casing.
<b>Non-destructive examination (NDE)</b>	The weld seam of pipe (except upset ends) furnished to this standard shall be inspected nondestructively full-length (100 %) by ultrasonic methods. The inspection shall be performed after all heat treatment and any subsequent rotary straightening operation. (API 5CT Latest Edition 9.15.10 and Table C.38).

<b>NDE of coupling stock</b>	<p>Coupling stock for couplings that will be fully machined may have imperfections on the unmachined surfaces, however the final machined surfaces shall meet the specified dimensions and the surface inspection criteria related to API 5CT Latest Edition 9.15.11.</p> <p>Couplings shall be manufactured from coupling material and NDE shall be performed after production.</p>									
<b>Hydrostatic Testing</b>	<p>Each length of pipe shall be tested full-length subsequent to final heat treatment to at least the hydrostatic pressure specified in equation below without leakage. The test conditions shall be held for not less than 5 s at full pressure.</p> <p>Test Pressure=<math>[2 * f * Y_{Smin} \text{ (MPa)} * \text{wall thickness (mm)}] / \text{Outside diameter (mm)}</math></p> <p>f is a factor: 0.6 (0.6) for Grades H40, J55, and K55 larger than Label 1: 9 5/8 or 0.8 (0.8) for all other grades and sizes.</p> <p>All pipes shall be hydrostatically tested according to API 5CT Latest Edition 9.12. If the calculated test pressure exceeds 10000 psi, test will be performed at 10000 psi.</p>									
<b>Dimensional Testing</b>	<p>For pipe, coupling stock, coupling material and accessory material, the manufacturer shall demonstrate conformance to the requirements of 7.3.2.</p> <p>For non-upset pipe, coupling stock, coupling material and accessory material, the measurements shall be made with pi-tapes (wrap tapes), micrometers, callipers or snap gauges.</p> <p>The manufacturer shall measure the diameter of both ends of pipe ordered as plain-end, coupling stock or coupling material.</p> <p>Dimensional checks shall be applied to all pipes and couplings as per API 5CT Latest Edition 9.13.2</p>									
<b>Height and trim of electric-weld flash</b>	<p>The outside flash of electric-welded pipe shall be trimmed to an essentially flush condition as per API 5CT Latest Edition 7.8.1.</p> <p>The height of the inside weld flash shall not exceed 1,14 mm (0.045 in) for casing or casing pup joints, measured from the inside surface adjacent to the flash as per API 5CT Latest Edition 7.8.2.</p>									
<b>Drift Testing and Outside Diameter Tolerances</b>	<p>Each length of pipe either threaded or plain-end shall be drift-tested throughout its entire length.</p> <p>D: Outside Diameter, d: Inside Diameter</p> <p>Casing :</p> <table border="0" data-bbox="475 1429 1058 1514"> <tr> <td>D &lt; 9-5/8</td> <td>Drift L=6inches</td> <td>Drift D= d-1/8</td> </tr> <tr> <td>D ≥ 9-5/8 to ≤ 13-3/8</td> <td>Drift L=12inches</td> <td>Drift D= d-5/32</td> </tr> <tr> <td>D &gt; 13-3/8</td> <td>Drift L=12inches</td> <td>Drift D= d-3/16</td> </tr> </table> <p>All the pipes shall be drifted as per API 5CT Table E.23.</p> <p>Outside Diameter Tolerances: <math>D &gt; 4-1/2 = +1 * \%D ; -0.5 * \%D</math> As per API 5CT Latest Edition 7.11.1</p>	D < 9-5/8	Drift L=6inches	Drift D= d-1/8	D ≥ 9-5/8 to ≤ 13-3/8	Drift L=12inches	Drift D= d-5/32	D > 13-3/8	Drift L=12inches	Drift D= d-3/16
D < 9-5/8	Drift L=6inches	Drift D= d-1/8								
D ≥ 9-5/8 to ≤ 13-3/8	Drift L=12inches	Drift D= d-5/32								
D > 13-3/8	Drift L=12inches	Drift D= d-3/16								
<b>Linear Imperfections</b>	<p>External an internal max. permissible depth of linear imperfections shall be according to API 5CT Latest Edition Table E.25—Maximum Permissible Depth of Linear Imperfections</p>									
<b>Threading</b>	<p>Product threads, gauging practice and thread inspection shall conform to the requirements of API Spec 5B Latest Edition.</p>									
<b>Anti-Galling Treatment</b>	<p>Coating on the couplings thread shall be coated with manganese phosphate or other phosphate coating.</p>									
<b>End Finishing</b>	<p>External coating (mill varnish) shall be applied to each pipe for protection from weathering and corrosive effects.</p> <p>Pipe and couplings shall be given an external coating for protection from rust while in transit. An attempt should be made to make these coatings smooth, hard to the touch and with minimum sags. The coating shall be rated to protect the pipe for at least six months as per API 5CT Latest Edition 11.1.1 &amp; 11.1.2.</p>									

<p><b>Certification</b></p>	<p>The manufacturer shall furnish to the purchaser a certificate of compliance stating that the material has been manufactured, sampled, tested and inspected in accordance with this Contract and has been found to meet the requirements.</p> <p>Test data and test conditions for impact, hardness and tensile tests (include elongation value), hydrostatic test pressure and duration, chemical analysis, test data for all diameter, wall thickness, grade, process of manufacture and type of heat treatment (include heat treatment temperature and duration) shall be specified. Results of all tests, ISO certificates shall be available as well as mill test certificate (MTC) and certificate of origin (CO).As per API 5CT Latest Edition 12.2 &amp; 12.3.</p>
<p><b>Marking</b></p>	<p>Stenciling or a combination of stenciling and stamping as per API Spec 5CT Latest Edition 11.</p> <p>Marking of each pipe shall contain the following; manufacturer’s name or mark, customer’s name or mark (TPAO), API license, purchase order number, date of manufacture, outer diameter (OD, inches), mass designation, grade, process of manufacture, length, type of thread, heat treatment and supplementary requirements. API monogram is mandatory for each pipe.</p> <p>We shall to ensure that clear differentiation of casings for example 13 3/8” pipes with different lb/ft values (exp. 54.5, 61, 68 and 72), the protective caps and markings/labelling must be painted with different colors. So that we can easy to distinguish the different wall thickness before the shipment of casings.</p> <p>Labeling should be done as shown in the examples below.</p> <p>The marking on the casing should include the short description specified in the order item. For example, "7" 26LB/FT N80Q LTC CASING.</p> <p>Example of Casing Labeling: Company Name API 5CT-xxxx CASING 9 5/8" 43.5LB/FT N80Q LTC Heat No.xxx Lot No.xxx Pipe No.xxx Length xx meter TPAO Tender No.xxxxx Order No.xxxxx Date of manufacture xxxx</p> <p>Example of Coupling Labeling: Company Name API 5CT-xxxx CASING COUPLING, 7" 26 LB/FT N-80Q LTC TPAO Tender No.xxxxxxx</p> <p>(In addition to this all diameters shall in accordance with inch)</p> <p>All markings shall be applied using the in English language.</p>
<p><b>Thread Protector &amp; Thread Compound</b></p>	<p>The entity performing the threading shall apply external and internal thread protectors of such design, material and mechanical strength to protect the thread and end of the pipe from damage under normal handling and transportation and to inhibit infiltration of dust and water to the threads during transportation and normal storage period. Normal storage period shall be considered as approximately one year. UV light resistant, closed ended protectors with a small ventilation hole shall be made up properly to box and pin ends immediately after final inspection. API modified thread compound in accordance with API RP 5A3 shall be applied to threads prior to making up thread protectors. Supplied protectors shall be compliant to API 5CT Annex F (“Requirements for Thread Protector Design and Validation”). Casing thread protector should be suitable for pipe hook implementation.</p> <p>Protector shall be used on both sides of the coupling for protection, and also separately requested couplings shall be packed in wooden boxes. It is important that the sleeves have a cover protector at both ends. Corrosion is observed due to our storage conditions.</p> <p>Steel-plastic composite protectors shall be used on 20" Casings.</p>
<p><b>Packaging</b></p>	<p>For delivery term other than DAP, the terms of the attached packaging specification shall apply (Packaging Technical Specification For Casing, Tubing and Accessories)</p>
<p><b>Inspection &amp; Rejection</b></p>	<p>Material which shows defects on inspection or subsequent to acceptance at manufacturer's works, or which proves defective when properly applied in service, may be rejected, and the manufacturer so notified. If tests that require the destruction of material are made, any product which is proven not to meet the requirements of this Standard shall be rejected. Disposition of rejected product shall be under manufacturer's responsibility as per API 5CT Latest Edition Annex B.4.</p> <p>Manufacturer will prepare and propose the inspection and Test Plan (ITP) or Quality Control Plan (QCP), including all manufacturing processes, tests (tensile testing, mechanical testing, hydrostatic testing, drift testing, nondestructive examination (NDE) et.) and the points that the sides (TPAO and manufacturer) engage in, according to technical specifications. Manufacturing will be started after ITP or QCP approved by TPAO.</p> <p>TPAO will be able to control any stages of manufacturing. If any discrepancy according to technical specification is detected, TPAO has rights of interfering and stopping the production.</p> <p>If TPAO asks for 3rd party inspection, all products shall be inspected by 3rd party inspection company. The inspector company shall be designated with the approval of TPAO. TPI cost shall be paid by TPAO.</p>

## GRADE - N80Q TECHNICAL SPECIFICATION

1. This specification is prepared for N80Q Casing requirement of TPAO. The specifications of API 5CT and API 5B are valid as well even if it is not mentioned here.

2. The Contractor is responsible for the supply and compliance of all offered materials. If not the direct manufacturer, it shall provide documentation evidencing its authorized relationship with the manufacturer. All production processes shall be completed by the same manufacturer qualified in accordance with API 5CT and API 5B latest editions.

Specification	Requirement
<b>Reference Documents:</b> ISO 13679/ API RP 5C5 latest edition API Specification 5CT latest edition API Spec 5B latest edition API RP 5A3 latest edition	Procedure for testing casing and tubing connections. Specification for casing and tubing. Specification for Threading, Gauging and Thread Inspection of Casing, Tubing, and Line Pipe Threads. Recommended practice on thread compound for casing, tubing and line pipe.
<b>Process of Manufacture</b>	Cold-drawn tubular products without appropriate heat treatment are not acceptable. Casing and accessory material for casing shall be seamless (API 5CT Latest Edition).
<b>Supplementary Requirements (SR)</b>	SR16 and SR44 are required.
<b>Material</b>	As per API Spec 5CT Latest Edition Table E.4 (Chemical Composition, (mass fraction %): Pmax. 0.030%, Smax. 0.030%). Chemical composition and percentage of all elements in steel shall be presented. All materials shall be certificated.
<b>Heat Treatment</b>	All N80Q casings shall be quenched and tempered as per API 5CT Latest Edition Table E.3.
<b>Length</b>	Range 3: Min 10,36 m, Max 12,80 m (API 5CT Latest Edition Table C.22). <b>Special Range 3: Min 10,36 m, Max 12,80 m.</b>
<b>Traceability</b>	All necessary procedures to maintain heat and lot identity shall be established and followed, pipes or lots shall be uniquely numbered in the order they are heat treated (API 5CT Latest Edition 5.4).
<b>Straightness</b>	Deviation from straight, or chord height, shall not exceed 24 mm for each pipe as per API 5CT Latest Edition 7.9 (see API 5CT Annex Figure D.13 and Figure D.14).  Straightness Evaluation shall be performed according to API 5CT Latest Edition 9.13.8.  The frequency of testing for casing shall be four per lot. Maximum number of pieces in a lot shall be 100.
<b>Tensile and Hardness</b>	Total elongation under load (%) = 0.5 Yield Strength (Mpa) = min. 552 - max. 758 Tensile Strength (Mpa) = min. 689 (API 5CT Latest Edition Table C.5).  The frequency of hardness testing shall be as per API Spec 5CT. The frequency of tensile testing for casing shall be performed as per API 5CT Latest Edition Table C.32.
<b>CVN Testing</b>	Charpy V-notch tests shall be carried out in accordance with A.16 (SR44) and API 5CT Latest Edition 6.4.4 The frequency of CVN testing for casing shall be performed as per API 5CT Latest Edition Table C.16.
<b>Processing of pin and box ends</b>	Pin and box threads shall be abrasive-blasted, unless processed by any appropriate technique (like CNC Machine), including the threading process, which has been agreed between the purchaser and manufacturer to be sufficient to avoid the presence of material susceptible to detaching or causing galling during make-up. It is sufficient that the inside and outside edges of the ends of all products are free from burrs.

<p><b>Wall thickness (t)</b></p>	<p>Wall thickness shall be measured over the full body, with a minimum coverage of 25 % of the surface area covered by the automatic system. The minimum measured wall thickness for each pipe shall be recorded.</p> <p>Wall thickness tolerance for pipe is <math>-12.5 \% \cdot t</math> as indicated in API 5CT Latest Edition 7.11.2.</p> <p>Each length of pipe, coupling stock, coupling material or accessory material shall be measured to verify conformance with wall thickness requirements. Wall thickness measurements shall be made with a mechanical calliper, a go/no-go gauge or with a properly calibrated NDE device of appropriate accuracy. API 5CT Latest Edition 9.13.4.</p> <p>PS: The wall thickness will be selected from Table C.1 according to the required outside diameter of casing.</p>
<p><b>Non-destructive examination (NDE)</b></p>	<p>All pipe and couplings that require NDE (except visual inspection) shall be inspected full-body, full-length for defects. (API 5CT Latest Edition 9.15 (Table C.37)).</p> <p>All pipe shall be inspected for the detection of imperfections on the outside and inside surfaces by one or more of the following methods:</p> <ul style="list-style-type: none"> <li>a) ultrasonic testing to acceptance level as specified in Table C.38 or Table E.38 in accordance with ISO 10893-10 or ASTM E213;</li> <li>b) flux leakage testing to acceptance level as specified in Table C.38 or Table E.38 in accordance with ISO 10893-3 or ASTM E570;</li> <li>c) eddy current concentric coil testing to acceptance level as specified in Table C.38 or Table E.38 in accordance with ISO 10893-2 or ASTM E309;</li> <li>d) for pipe outside surface, magnetic particle inspection in accordance with ISO 10893-5 or ASTM E3024. (API 5CT Latest Edition 9.15.6)</li> </ul>
<p><b>NDE of coupling stock</b></p>	<p>Coupling stock for couplings that will be fully machined may have imperfections on the unmachined surfaces, however the final machined surfaces shall meet the specified dimensions and the surface inspection criteria related to API 5CT Latest Edition 9.15.11.</p> <p>Couplings shall be manufactured from coupling material and NDE shall be performed after production.</p>
<p><b>Hydrostatic Testing</b></p>	<p>Each length of pipe shall be tested full-length subsequent to final heat treatment to at least the hydrostatic pressure specified in equation below without leakage. The test conditions shall be held for not less than 5 s at full pressure.</p> <p>Test Pressure = <math>[2 \cdot f \cdot Y_{\text{min}} \cdot (\text{MPa}) \cdot \text{wall thickness}(\text{mm})] / \text{Outside diameter}(\text{mm})</math></p> <p>f is a factor: 0.6 (0.6) for Grades H40, J55, and K55 larger than Label 1: 9 5/8 or 0.8 (0.8) for all other grades and sizes.</p> <p>All pipes shall be hydrostatically tested according to API 5CT Latest Edition 9.12. If the calculated test pressure exceeds 10000 psi, test will be performed at 10000 psi.</p>
<p><b>Dimensional Testing</b></p>	<p>For pipe, coupling stock, coupling material and accessory material, the manufacturer shall demonstrate conformance to the requirements of 7.3.2.</p> <p>For non-upset pipe, coupling stock, coupling material and accessory material, the measurements shall be made with pi-tapes (wrap tapes), micrometers, callipers or snap gauges.</p> <p>The manufacturer shall measure the diameter of both ends of pipe ordered as plain-end, coupling stock or coupling material.</p> <p>Dimensional checks shall be applied to all pipes and couplings as per API 5CT Latest Edition 9.13.2</p>
<p><b>Outside Diameter Tolerances</b></p>	<p>The following tolerances apply to the outside diameter, D, of pipe:</p> <p><math>D &lt; 4\text{-}1/2 = \pm 0.79\text{mm} (\pm 0.031 \text{ in.})</math></p> <p><math>D \geq 4\text{-}1/2 = +1 \% D ; -0.5 \% D</math></p> <p>As per API 5CT Latest Edition 7.11.1.</p>

<b>Straightness</b>	<p>Deviation from straight, or chord height, shall not exceed 24 mm for each pipe as per API 5CT Latest Edition 7.9.</p> <p>The frequency of testing for casing shall be four per lot. Maximum number of pieces in a lot shall be 100.</p>									
<b>Drift Testing</b>	<p>Each length of pipe either threaded or plain-end shall be drift-tested throughout its entire length.</p> <p>D: Outside Diameter, d: Inside Diameter</p> <p>Casing :</p> <table border="0" data-bbox="475 510 1075 600"> <tr> <td>D &lt; 9-5/8"</td> <td>Drift L=6inches</td> <td>Drift D= d-1/8"</td> </tr> <tr> <td>D ≥ 9-5/8" to ≤ 13-3/8"</td> <td>Drift L=12inches</td> <td>Drift D= d-5/32"</td> </tr> <tr> <td>D &gt; 13-3/8"</td> <td>Drift L=12inches</td> <td>Drift D= d-3/16"</td> </tr> </table> <p>All the pipes shall be drifted as per API 5CT Table E.23.</p>	D < 9-5/8"	Drift L=6inches	Drift D= d-1/8"	D ≥ 9-5/8" to ≤ 13-3/8"	Drift L=12inches	Drift D= d-5/32"	D > 13-3/8"	Drift L=12inches	Drift D= d-3/16"
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D > 13-3/8"	Drift L=12inches	Drift D= d-3/16"								
<b>Linear Imperfections</b>	<p>External an internal max. permissible depth of linear imperfections shall be according to API 5CT Latest Edition Table E.25—Maximum Permissible Depth of Linear Imperfections</p>									
<b>Threading</b>	<p>Product threads, gauging practice and thread inspection shall conform to the requirements of API Spec 5B Latest Edition.</p>									
<b>Anti-Galling Treatment</b>	<p>Coating on the couplings thread shall be coated with manganese phosphate or other phosphate coating.</p>									
<b>End Finishing</b>	<p>External coating (mill varnish) shall be applied to each pipe for protection from weathering and corrosive effects.</p> <p>Pipe and couplings shall be given an external coating for protection from rust while in transit. An attempt should be made to make these coatings smooth, hard to the touch and with minimum sags. The coating shall be rated to protect the pipe for at least six months as per API 5CT Latest Edition 11.1.1 &amp; 11.1.2.</p>									
<b>Certification</b>	<p>The manufacturer shall furnish to the purchaser a certificate of compliance stating that the material has been manufactured, sampled, tested and inspected in accordance with this Contract and has been found to meet the requirements.</p> <p>Test data and test conditions for impact, hardness and tensile tests (include elongation value), hydrostatic test pressure and duration, chemical analysis, test data for all diameter, wall thickness, grade, process of manufacture and type of heat treatment (include heat treatment temperature and duration) shall be specified. Results of all tests, ISO certificates shall be available as well as mill test certificate (MTC) and certificate of origin (CO).As per API 5CT Latest Edition 12.2 &amp; 12.3.</p>									
<b>Marking</b>	<p>Stenciling or a combination of stenciling and stamping as per API Spec 5CT Latest Edition 11.</p> <p>Marking of each pipe shall contain the following; manufacturer's name or mark, customer's name or mark (TPAO), API license, purchase order number, date of manufacture, outer diameter (OD, inches), mass designation, grade, process of manufacture, length, type of thread, heat treatment and supplementary requirements. API monogram is mandatory for each pipe.</p> <p>We shall to ensure that clear differentiation of casings for example 13 3/8" pipes with different lb/ft values (exp. 54.5, 61, 68 and 72), the protective caps and markings/labelling must be painted with different colors. So that we can easy to distinguish the different wall thickness before the shipment of casings.</p> <p>Labeling should be done as shown in the examples below.</p> <p>The marking on the casing should include the short description specified in the order item. For example, "7" 26LB/FT N80Q LTC CASING.</p> <p>Example of Casing Labeling: Company Name API 5CT-xxxx CASING 9 5/8" 43.5LB/FT N80Q LTC Heat No.xxx Lot No.xxx Pipe No.xxx Length xx meter TPAO Tender No.xxxxxx Order No.xxxxxx Date of manufacture xxxx</p> <p>Example of Coupling Labeling: Company Name API 5CT-xxxx CASING COUPLING, 7" 26 LB/FT N-80Q LTC TPAO Tender No.xxxxxxx</p> <p>(In addition to this all diameters shall in accordance with inch)</p> <p>All markings shall be applied using the in English language.</p>									

<p><b>Thread Protector &amp; Thread Compound</b></p>	<p>The entity performing the threading shall apply external and internal thread protectors of such design, material and mechanical strength to protect the thread and end of the pipe from damage under normal handling and transportation and to inhibit infiltration of dust and water to the threads during transportation and normal storage period. Normal storage period shall be considered as approximately one year. UV light resistant, closed ended protectors with a small ventilation hole shall be made up properly to box and pin ends immediately after final inspection. API modified thread compound in accordance with API RP 5A3 shall be applied to threads prior to making up thread protectors. Supplied protectors shall be compliant to API 5CT Annex F ("Requirements for Thread Protector Design and Validation"). Casing thread protector should be suitable for pipe hook implementation. Protector shall be used on both sides of the coupling for protection, and also separately requested couplings shall be packed in wooden boxes. It is important that the sleeves have a cover protector at both ends. Corrosion is observed due to our storage conditions.</p>
<p><b>Packaging</b></p>	<p>For delivery term other than DAP, the terms of the attached packaging specification shall apply (Packaging Technical Specification For Casing, Tubing and Accessories)</p>
<p><b>Inspection &amp; Rejection</b></p>	<p>Material which shows defects on inspection or subsequent to acceptance at manufacturer's works, or which proves defective when properly applied in service, may be rejected, and the manufacturer so notified. If tests that require the destruction of material are made, any product which is proven not to meet the requirements of this Standard shall be rejected. Disposition of rejected product shall be under manufacturer's responsibility as per API 5CT Latest Edition Annex B.4.</p> <p>Manufacturer will prepare and propose the inspection and Test Plan (ITP) or Quality Control Plan (QCP), including all manufacturing processes, tests (tensile testing, mechanical testing, hydrostatic testing, drift testing, nondestructive examination (NDE) et.) and the points that the sides (TPAO and manufacturer) engage in, according to technical specifications. Manufacturing will be started after ITP or QCP approved by TPAO.</p> <p>TPAO will be able to control any stages of manufacturing. If any discrepancy according to technical specification is detected, TPAO has rights of interfering and stopping the production.</p> <p>If TPAO asks for 3rd party inspection, all products shall be inspected by 3rd party inspection company. The inspector company shall be designated with the approval of TPAO. TPI cost shall be paid by TPAO.</p>

## GRADE - P110 TECHNICAL SPECIFICATION

1. This specification is prepared for P110 Casing requirement of TPAO. The specifications of API 5CT and API 5B are valid as well even if it is not mentioned here.
2. The Contractor is responsible for the supply and compliance of all offered materials. If not the direct manufacturer, it shall provide documentation evidencing its authorized relationship with the manufacturer. All production processes shall be completed by the same manufacturer qualified in accordance with API 5CT and API 5B latest editions.

Specification	Requirement
<b>Reference Documents:</b> ISO 13679/ API RP 5C5 latest edition API Specification 5CT latest edition API Spec 5B latest edition API RP 5A3 latest edition	Procedure for testing casing and tubing connections. Specification for casing and tubing. Specification for Threading, Gauging and Thread Inspection of Casing, Tubing, and Line Pipe Threads. Recommended practice on thread compound for casing, tubing and line pipe.
<b>Process of Manufacture</b>	Cold-drawn tubular products without appropriate heat treatment are not acceptable. Casing and accessory material for casing shall be seamless (API 5CT Latest Edition).
<b>Supplementary Requirements (SR)</b>	SR2, SR16, SR42 and SR44 are required.
<b>Material</b>	As per API Spec 5CT Latest Edition Table E.4 (Chemical Composition, (mass fraction %): Pmax. 0.030%, Smax. 0.030%). Chemical composition and percentage of all elements in steel shall be presented. All materials shall be certificated.
<b>Heat Treatment</b>	All P110 casings shall be quenched and tempered as per API 5CT Latest Edition Table E.3.
<b>Length</b>	Range 3: Min 10,36 m, Max 12,80 m (API 5CT Latest Edition Table C.22). <b>Special Range 3: Min 10,36 m, Max 12,80 m.</b>
<b>Traceability</b>	All necessary procedures to maintain heat and lot identity shall be established and followed, pipes or lots shall be uniquely numbered in the order they are heat treated (API 5CT Latest Edition 5.4).
<b>Straightness</b>	Deviation from straight, or chord height, shall not exceed 24 mm for each pipe as per API 5CT Latest Edition 7.9 (see API 5CT Annex Figure D.13 and Figure D.14).  Straightness Evaluation shall be performed according to API 5CT Latest Edition 9.13.8.  The frequency of testing for casing shall be four per lot. Maximum number of pieces in a lot shall be 100.
<b>Straightening</b>	Gag press straightening or hot rotary straightening [400 °C (750 °F) minimum at end of rotary straightening is acceptable. If hot rotary straightening is not possible, the pipe may be cold rotary straightened provided it is then stress-relieved at 510 °C (950 °F) or higher (API 5CT Latest Edition Annex A.14).
<b>Tensile and Hardness</b>	Total elongation under load (%) = 0.6 Yield Strength (Mpa) = min. 758 - max. 965 Tensile Strength (Mpa) = min. 862 (API 5CT Latest Edition Table C.5).  The frequency of hardness testing shall be as per API Spec 5CT. The frequency of tensile testing for casing shall be performed as per API 5CT Table C.32.
<b>CVN Testing</b>	Charpy V-notch tests shall be carried out in accordance with A.16 (SR44) and API 5CT Latest Edition 6.4.4 The frequency of CVN testing for casing shall be performed as per API 5CT Latest Edition Table C.16.
<b>Processing of pin and box ends</b>	Pin and box threads shall be abrasive-blasted, unless processed by any appropriate technique (like CNC Machine), including the threading process, which has been agreed between the purchaser and manufacturer to be sufficient to avoid the presence of material susceptible to detaching or causing galling during make-up. It is sufficient that the inside and outside edges of the ends of all products are free from burrs.

<p><b>Wall thickness (t)</b></p>	<p>Wall thickness shall be measured over the full body, with a minimum coverage of 25 % of the surface area covered by the automatic system. The minimum measured wall thickness for each pipe shall be recorded.</p> <p>Wall thickness tolerance for pipe is <math>-12.5 \%t</math> as indicated in API 5CT Latest Edition 7.11.2.</p> <p>Each length of pipe, coupling stock, coupling material or accessory material shall be measured to verify conformance with wall thickness requirements. Wall thickness measurements shall be made with a mechanical calliper, a go/no-go gauge or with a properly calibrated NDE device of appropriate accuracy. API 5CT Latest Edition 9.13.4.</p> <p>PS: The wall thickness will be selected from Table C.1 according to the required outside diameter of casing.</p>
<p><b>Non-destructive examination (NDE)</b></p>	<p>All pipe and couplings that require NDE (except visual inspection) shall be inspected full-body, full-length for defects. (API 5CT Latest Edition 9.15 (Table C.37).</p> <p>All pipe shall be inspected for the detection of both longitudinal and transverse imperfections on the outside and inside surfaces to acceptance level L2 by one or more of the following methods:</p> <ul style="list-style-type: none"> <li>a) ultrasonic testing in accordance with ISO 10893-10 or ASTM E213 (longitudinal) and ISO 10893-10 or ASTM E213 (transverse);</li> <li>b) flux leakage testing in accordance with ISO 10893-3 or ASTM E570 (longitudinal) and ISO 10893-3 or ASTM E570 (transverse);</li> <li>c) eddy current concentric coil testing in accordance with ISO 10893-2 or ASTM E309.</li> </ul> <p>(API 5CT Latest Edition 9.15.8)</p>
<p><b>NDE of coupling stock</b></p>	<p>Coupling stock for couplings that will be fully machined may have imperfections on the unmachined surfaces, however the final machined surfaces shall meet the specified dimensions and the surface inspection criteria related to API 5CT Latest Edition 9.15.11.</p> <p>Couplings shall be manufactured from coupling material and NDE shall be performed after production.</p>
<p><b>Hydrostatic Testing</b></p>	<p>Each length of pipe shall be tested full-length subsequent to final heat treatment to at least the hydrostatic pressure specified in equation below without leakage. The test conditions shall be held for not less than 5 s at full pressure.</p> <p>Test Pressure = <math>[2 * f * Y_{Smin} * (MPa) * wall\ thickness(mm)] / Outside\ diameter\ (mm)</math></p> <p>f is a factor: 0.6 (0.6) for Grades H40, J55, and K55 larger than Label 1: 9 5/8 or 0.8 (0.8) for all other grades and sizes.</p> <p>All pipes shall be hydrostatically tested according to API 5CT Latest Edition 9.12. If the calculated test pressure exceeds 10000 psi, test will be performed at 10000 psi.</p>
<p><b>Dimensional Testing</b></p>	<p>For pipe, coupling stock, coupling material and accessory material, the manufacturer shall demonstrate conformance to the requirements of 7.3.2.</p> <p>For non-upset pipe, coupling stock, coupling material and accessory material, the measurements shall be made with pi-tapes (wrap tapes), micrometers, callipers or snap gauges.</p> <p>The manufacturer shall measure the diameter of both ends of pipe ordered as plain-end, coupling stock or coupling material.</p> <p>Dimensional checks shall be applied to all pipes and couplings as per API 5CT Latest Edition 9.13.2</p>
<p><b>Outside Diameter Tolerances</b></p>	<p>The following tolerances apply to the outside diameter, D, of pipe:</p> <p><math>D &lt; 4-1/2 = \pm 0.79mm (\pm 0.031\ in.)</math>  <math>D \geq 4-1/2 = +1 \%D ; -0.5 \%D</math></p> <p>As per API 5CT Latest Edition 7.11.1.</p>

<b>Straightness</b>	<p>Deviation from straight, or chord height, shall not exceed 24 mm for each pipe as per API 5CT Latest Edition 7.9.</p> <p>The frequency of testing for casing shall be four per lot. Maximum number of pieces in a lot shall be 100.</p>									
<b>Drift Testing</b>	<p>Each length of pipe either threaded or plain-end shall be drift-tested throughout its entire length.</p> <p>D: Outside Diameter, d: Inside Diameter</p> <p>Casing :</p> <table border="0" data-bbox="475 501 1075 589"> <tr> <td>D &lt; 9-5/8"</td> <td>Drift L=6inches</td> <td>Drift D= d-1/8"</td> </tr> <tr> <td>D ≥ 9-5/8" to ≤ 13-3/8"</td> <td>Drift L=12inches</td> <td>Drift D= d-5/32"</td> </tr> <tr> <td>D &gt; 13-3/8"</td> <td>Drift L=12inches</td> <td>Drift D= d-3/16"</td> </tr> </table> <p>All the pipes shall be drifted as per API 5CT Table E.23.</p>	D < 9-5/8"	Drift L=6inches	Drift D= d-1/8"	D ≥ 9-5/8" to ≤ 13-3/8"	Drift L=12inches	Drift D= d-5/32"	D > 13-3/8"	Drift L=12inches	Drift D= d-3/16"
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<b>Linear Imperfections</b>	<p>External an internal max. permissible depth of linear imperfections shall be according to API 5CT Latest Edition Table E.25—Maximum Permissible Depth of Linear Imperfections</p>									
<b>Threading</b>	<p>Product threads, gauging practice and thread inspection shall conform to the requirements of API Spec 5B Latest Edition.</p>									
<b>Anti-Galling Treatment</b>	<p>Coating on the couplings thread shall be coated with manganese phosphate or other phosphate coating.</p>									
<b>End Finishing</b>	<p>External coating (mill varnish) shall be applied to each pipe for protection from weathering and corrosive effects.</p> <p>Pipe and couplings shall be given an external coating for protection from rust while in transit. An attempt should be made to make these coatings smooth, hard to the touch and with minimum sags. The coating shall be rated to protect the pipe for at least six months as per API 5CT Latest Edition 11.1.1 &amp; 11.1.2.</p>									
<b>Certification</b>	<p>The manufacturer shall furnish to the purchaser a certificate of compliance stating that the material has been manufactured, sampled, tested and inspected in accordance with this Contract and has been found to meet the requirements.</p> <p>Test data and test conditions for impact, hardness and tensile tests (include elongation value), hydrostatic test pressure and duration, chemical analysis, test data for all diameter, wall thickness, grade, process of manufacture and type of heat treatment (include heat treatment temperature and duration) shall be specified. Results of all tests, ISO certificates shall be available as well as mill test certificate (MTC) and certificate of origin (CO).</p> <p>As per API 5CT Latest Edition 12.2 &amp; 12.3.</p>									
<b>Marking</b>	<p>Stenciling or a combination of stenciling and stamping as per API Spec 5CT Latest Edition 11. Marking of each pipe shall contain the following; manufacturer's name or mark, customer's name or mark (TPAO), API license, purchase order number, date of manufacture, outer diameter (OD, inches), mass designation, grade, process of manufacture, length, type of thread, heat treatment and supplementary requirements. API monogram is mandatory for each pipe.</p> <p>We shall to ensure that clear differentiation of casings for example 13 3/8" pipes with different lb/ft values (exp. 54.5, 61, 68 and 72), the protective caps and markings/labelling must be painted with different colors. So that we can easy to distinguish the different wall thickness before the shipment of casings.</p> <p>Labeling should be done as shown in the examples below.</p> <p>The marking on the casing should include the short description specified in the order item. For example, "7" 26LB/FT N80Q LTC CASING.</p> <p>Example of Casing Labeling: Company Name API 5CT-xxxx CASING 9 5/8" 43.5LB/FT N80Q LTC Heat No.xxx Lot No.xxx Pipe No.xxx Length xx meter TPAO Tender No.xxxxxx Order No.xxxxxx Date of manufacture xxxx</p> <p>Example of Coupling Labeling: Company Name API 5CT-xxxx CASING COUPLING, 7" 26 LB/FT N-80Q LTC TPAO Tender No.xxxxxxx</p> <p>(In addition to this all diameters shall in accordance with inch)</p> <p>All markings shall be applied using the in English language.</p>									

<p><b>Thread Protector &amp; Thread Compound</b></p>	<p>The entity performing the threading shall apply external and internal thread protectors of such design, material and mechanical strength to protect the thread and end of the pipe from damage under normal handling and transportation and to inhibit infiltration of dust and water to the threads during transportation and normal storage period. Normal storage period shall be considered as approximately one year. UV light resistant, closed ended protectors with a small ventilation hole shall be made up properly to box and pin ends immediately after final inspection. API modified thread compound in accordance with API RP 5A3 shall be applied to threads prior to making up thread protectors. Supplied protectors shall be compliant to API 5CT Annex F ("Requirements for Thread Protector Design and Validation"). Casing thread protector should be suitable for pipe hook implementation. Protector shall be used on both sides of the coupling for protection, and also separately requested couplings shall be packed in wooden boxes. It is important that the sleeves have a cover protector at both ends. Corrosion is observed due to our storage conditions.</p>
<p><b>Packaging</b></p>	<p>For delivery term other than DAP, the terms of the attached packaging specification shall apply (Packaging Technical Specification For Casing, Tubing and Accessories)</p>
<p><b>Inspection &amp; Rejection</b></p>	<p>Material which shows defects on inspection or subsequent to acceptance at manufacturer's works, or which proves defective when properly applied in service, may be rejected, and the manufacturer so notified. If tests that require the destruction of material are made, any product which is proven not to meet the requirements of this Standard shall be rejected. Disposition of rejected product shall be under manufacturer's responsibility as per API 5CT Latest Edition Annex B.4.</p> <p>Manufacturer will prepare and propose the inspection and Test Plan (ITP) or Quality Control Plan (QCP), including all manufacturing processes, tests (tensile testing, mechanical testing, hydrostatic testing, drift testing, nondestructive examination (NDE) et.) and the points that the sides (TPAO and manufacturer) engage in, according to technical specifications. Manufacturing will be started after ITP or QCP approved by TPAO.</p> <p>TPAO will be able to control any stages of manufacturing. If any discrepancy according to technical specification is detected, TPAO has rights of interfering and stopping the production.</p> <p>If TPAO asks for 3rd party inspection, all products shall be inspected by 3rd party inspection company. The inspector company shall be designated with the approval of TPAO. TPI cost shall be paid by TPAO.</p>