

API 5CT Q125 Inspection and Testing Checklist

Detailed technical reference for Q125 casing and tubing inspection: mechanical verification, heat-treatment control, pipe-body integrity, connection inspection and release documentation.

Grade identity	Main product forms	Core inspection logic	Critical caution
API 5CT Q125 - high-strength OCTG grade identified by 125 ksi minimum yield strength.	Casing, tubing, coupling stock, pup joints and related accessory material where Q125 is specified.	Confirm strength range, heat-treatment consistency, toughness response, pipe-body integrity, connection geometry and heat/lot traceability.	A high-strength pipe body does not automatically validate sour-service suitability, collapse performance or connection capacity.

1. Mechanical Verification Data

For Q125, tensile testing is not a routine formality. It verifies whether the delivered casing or tubing falls inside the intended high-strength window and whether pipe-body strength can support the well design load case.

Item	Reference / Check Point	Technical Meaning for Q125	Record to Review
Minimum yield strength	125,000 psi / 862 MPa	Lower limit of Q125 yield-strength range; confirms the grade strength identity.	Tensile report, specimen orientation, heat/lot traceability
Maximum yield strength	150,000 psi / 1,034 MPa	Upper limit helps prevent uncontrolled over-strength behavior; important for toughness and sour-service risk review.	Tensile report, heat-treatment batch, retest record if applicable
Minimum tensile strength	135,000 psi / 931 MPa	Confirms minimum ultimate tensile capacity before fracture under tensile loading.	Tensile report and MTC
Total elongation under load	Common public Q125 tables list 0.650%	Useful as a reference data point; final elongation and test method should follow the applicable standard edition and MTC.	MTC, tensile test method and specimen data
Common heat-treatment condition	Quenched and tempered	Q&T; route is used to obtain high strength with controlled toughness and hardness response.	Heat-treatment records, furnace charts where required, lot release records

Note: Public Q125 property tables commonly list yield strength as 862-1,034 MPa and tensile strength as 931 MPa minimum. Final acceptance should always be based on the applicable API 5CT / ISO 11960 edition, purchase order and certified mill test data.

2. Inspection and Test Matrix

The following matrix expands the inspection block into practical review points. It separates what each test confirms, what data should be visible in the report, and where the most common acceptance risks appear.

Inspection / Test	What It Confirms	Q125-Specific Review Points	Typical Evidence / Report
Tensile test	Yield and tensile strength meet Q125 range.	Check lower and upper yield range, tensile minimum, specimen location/orientation and heat/lot consistency. For high-strength grades, over-strength should not be ignored.	Tensile test report, MTC, heat number, lot ID
Hardness test	Heat treatment and strength level are controlled.	Review hardness frequency, locations and variation. For Q125, hardness review helps detect uneven quench/temper response and potential sour-service sensitivity.	Hardness report, heat-treatment lot, retest record
Impact test	Toughness response under specified condition.	API 5CT 11th Edition Addendum 1 states that Grades C110, C125 and Q125 pipe require impact testing in accordance with the relevant impact-test clause. Absorbed-energy acceptance depends on grade, wall and specimen basis.	Charpy V-notch report, test temperature, specimen size, absorbed energy values
Hydrostatic test	Pipe body pressure-holding capacity without leakage.	Confirm test pressure, holding time, product size, end condition and whether coupling/threaded product was tested in the required configuration.	Hydrotest certificate, pressure chart/record, pipe list
Drift test	Internal clearance for running tools and completion equipment.	Check drift mandrel basis, pipe size, wall/weight, connection type and actual lot coverage. Drift is critical when thick-wall high-strength strings reduce ID.	Drift test report or inspection record
Full-body NDE	Pipe body defect detection before use.	ISO 11960 preview lists full-body, full-length NDE of casing and tubing for Grades L80 13Cr, C90, T95, C110 and Q125. Confirm method, coverage, calibration and acceptance level.	UT/EMI/MPI reports as applicable, calibration blocks, NDE map
Dimensional inspection	OD, wall thickness, straightness, length and mass match specification.	For Q125, dimensional control affects collapse, tensile design, drift clearance and connection compatibility. Check OD, WT, ovality/straightness where specified, length range and mass/weight per foot.	Dimensional report, measurement log, packing list

3. Connection, Coupling and End-Finish Inspection

Q125 pipe-body strength only becomes useful when the connection can carry the required tensile load, sealing demand and make-up condition. Connection inspection should be reviewed separately from pipe-body mechanical data.

Check Point	Inspection Focus	Why It Matters for Q125	Evidence to Keep
Thread inspection	Thread profile, taper, pitch, height, surface condition and gauging against API 5B or connection specification.	Connection geometry controls make-up reliability, tensile efficiency and seal behavior. Small thread defects can control failure even when the pipe body meets Q125 strength.	Thread inspection report, gauge records, photos if required
Coupling inspection	Coupling grade/material match, thread quality, heat treatment, markings, phosphate/coating where applicable.	Coupling mismatch can reduce connection integrity, pressure sealing and traceability. Coupling stock requirements should be reviewed for high-strength grades.	Coupling MTC, heat/lot map, thread report
End finish	Plain end, threaded and coupled, STC/LTC/BTC or premium connection as specified.	End finish and connection type affect running, make-up torque, tensile capacity, sealability and compatibility with the casing string design.	PO, packing list, tally, connection spec
Surface condition at thread/coupling	Burrs, tears, cracks, laps, scabs, corrosion and handling damage.	Public Q125 product references emphasize that thread surfaces should be smooth and free of defects that may affect strength or tight connection.	Visual inspection report, repair/disposition record
Thread protectors	Protector type, installation condition and damage control before shipment.	High-strength OCTG can lose value before arrival if threads are damaged during handling, bundling or transport.	Final visual inspection, packing photos, shipping release

Connection selection should be reviewed against the actual well load case. STC/LTC may be suitable under appropriate conditions, while BTC or premium connections are often reviewed for higher-load, higher-pressure or higher-sealing requirements.

4. Document and Traceability Release Checklist

A Q125 release package should allow the pipe identity to be traced from marking to heat, lot, test result, NDE release and packing list. This is especially important when mixed sizes, multiple heats, threaded/coupled items or third-party inspection points are involved.

Release Document	Minimum Technical Content to Check	Why It Matters
MTC / material certificate	Grade Q125, heat number, chemical composition, mechanical properties, heat treatment, product size, manufacturing route and standard edition.	Links delivered pipe to chemistry and mechanical records; prevents grade/heat confusion.
Heat / lot map	Pipe numbers, bundle numbers, heat numbers, lot ID, coupling heat if separate, and tally reference.	Controls traceability when multiple heats or mixed sizes are shipped together.
NDE report	Method, coverage, calibration reference, acceptance basis, rejected/reworked items and final release list.	Confirms pipe-body integrity before shipment; high-strength pipe is less tolerant of hidden defects.
Hydrotest record	Test pressure, duration/hold record, product list, result and operator/inspector sign-off.	Confirms pipe body pressure-holding condition before field use.
Drift test record	Drift basis, pipe size/weight, tool ID clearance requirement and pipe list.	Reduces tool-running and completion clearance risk.
Thread/coupling inspection	Connection type, gauging, visual surface check, coupling match and protector condition.	Connection failure can control the final string limit even if pipe-body strength is acceptable.
Final packing list / tally	OD, wall, weight, length range, quantity, bundle number, heat/lot reference, end finish and destination marking.	Makes shipment release auditable and reduces receiving disputes.

Practical acceptance note

For API 5CT Q125 casing and tubing, inspection should not stop at a single tensile-property table. The final release should align mechanical test data, hardness and impact results, NDE coverage, hydrotest/drift records, thread/coupling inspection and traceability documents with the purchase order and project ITP.

5. Use Cautions for Q125 Inspection Review

Q125 is a high-strength grade, but high strength can introduce review points that lower grades may not emphasize as strongly. These points should be considered before accepting the pipe for a severe or non-routine well section.

Risk Area	Why It Needs Review	Inspection / Data Response
Sour service / H2S	High-strength steels can be more sensitive to sulfide stress cracking depending on hardness, stress and environment.	Do not treat Q125 as sour-service grade by default; review NACE MR0175 / ISO 15156, hardness and project-specific SSC requirements.
Collapse-sensitive sections	Collapse resistance is affected by OD, wall thickness, ovality, residual stress and manufacturing control, not grade name alone.	Check collapse basis, dimensional control, full-body NDE and any high-collapse product qualification if specified.
Connection-limited design	The connection may limit tensile, sealing or make-up performance before the pipe body reaches its theoretical strength.	Review connection specification, thread/gauge inspection, coupling match and make-up requirements.
Heat-treatment variation	Q125 relies on Q&T; processing; uneven heat treatment can affect hardness, strength and toughness response.	Review heat-treatment lot, tensile/hardness/impact test reports and traceability.
Field handling damage	Thread damage or surface defects can reduce connection reliability or trigger rejection on site.	Check thread protector condition, final visual inspection and packing/shipping records.

Reference notes

- API Spec 5CT 11th Edition Addendum 1: confirms impact testing for Grades C110, C125 and Q125 pipe in accordance with the relevant impact testing clause.
- ISO 11960:2020 preview: lists full-body, full-length NDE of casing and tubing for Grades L80 13Cr, C90, T95, C110 and Q125, and identifies tensile, hardness, impact and NDE topics for well casing/tubing.
- API 5B should be used where threading, gauging practice and thread inspection methods are relevant; premium connections shall follow the connection owner/project specification.
- Public Q125 product data commonly lists 862-1,034 MPa yield strength and 931 MPa minimum tensile strength; final data must be verified against the MTC and applicable standard edition.