How X95 and G105 Drill Pipe Is Released Joint by Joint

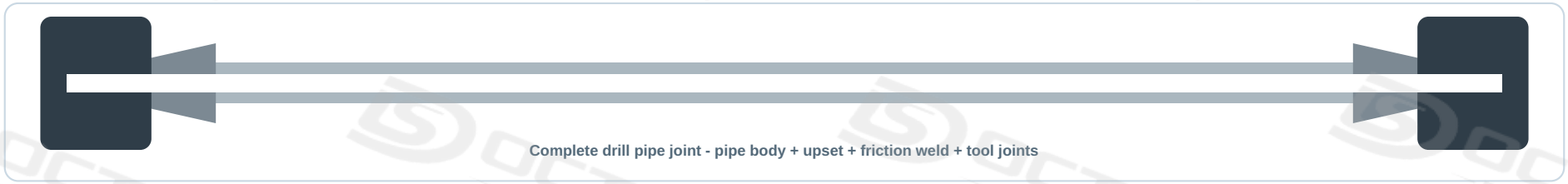
API 5DP / ISO 11961 steel drill pipe - material identity, assembly inspection and shipment release

GRADE ACCEPTANCE ANCHORS

X95	95-125 ksi yield | 105 ksi min tensile
G105	105-135 ksi yield | 115 ksi min tensile

Grade marking identifies the intended pipe-body grade. Release requires the pipe body, tool joint, friction weld, connection and shipment record to remain linked to the same finished joint.

1. Pipe Body Identification
2. Tool Joint Identification
3. Friction Welding
4. Weld-Zone Inspection
5. Connection + Drift Inspection
6. Packing + Shipment Release



Complete drill pipe joint - pipe body + upset + friction weld + tool joints

Joint No.	Body Heat	Test Lot	TJ Heat	Weld Lot	Connection	Inspection	Bundle	Packing List

ONE FINISHED JOINT = ONE LINKED MATERIAL AND INSPECTION RECORD

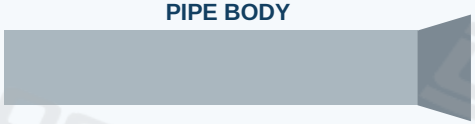
Material ID	Assembly	Inspection	Connection	Shipment
Heat + test lot linked	Tool-joint heat + weld lot	NDT + hardness + dimensions	Gauge + shoulder + drift	Joint list + bundle + packing list

Material Identity Is Fixed Before Friction Welding

The pipe body and tool joint arrive under separate heat and test records; the production traveler binds them before assembly.

SEPARATE COMPONENTS BEFORE ASSEMBLY

PIPE BODY



- Heat: PB-H24871
- Test lot: TL-95-042
- Grade: X95 / G105
- Upset: IU / EU / IEU

TOOL JOINT

- Heat: TJ-H9302
- Connection: NC / FH / IF
- Serial: JNT-000184

Identity is locked before the friction-weld cycle starts.

PRE-WELD IDENTITY RECORD

Record field	Required entry	Release purpose
Pipe-body heat	Physical marking + MTC	Confirms grade and chemistry
Pipe-body test lot	Mechanical / impact batch	Links test results to the body
Tool-joint heat	Heat marked on tool joint	Confirms tool-joint metallurgy
Grade	X95 or G105	Controls the strength window
Size + nominal weight	OD and lb/ft	Fixes dimensional configuration
Upset type	IU, EU or IEU	Fixes the weld-end geometry
Connection	NC, FH, IF or project type	Controls tool-joint inspection
Joint serial number	Unique finished-joint ID	Maintains joint-level traceability

MTC GRADE CHECK

X95: 95-125 ksi YS; 105 ksi min TS

G105: 105-135 ksi YS; 115 ksi min TS

HOLD BEFORE WELDING

HOLD

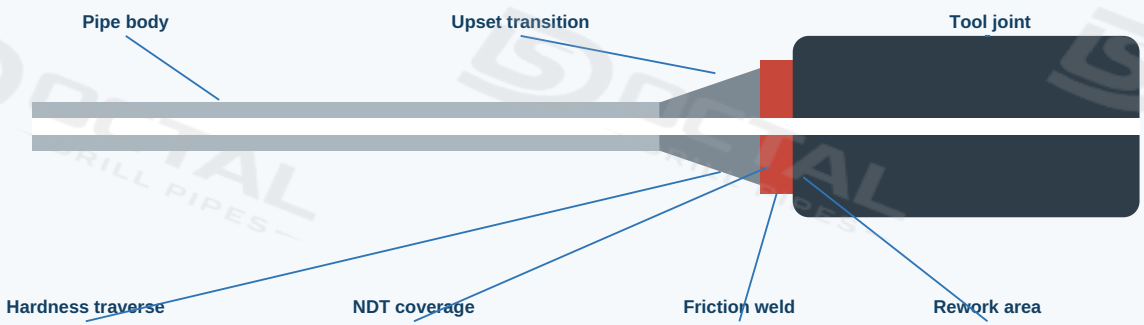
Missing heat ID | MTC mismatch | mixed grade/size | no joint number

An approved X95 or G105 pipe body must not be assembled with an unverified tool joint.

The Friction Weld Becomes a New Inspection Unit

After welding, the finished assembly receives its own alignment, hardness, NDT and rework status.

FRICTION-WELD CUTAWAY AND INSPECTION ZONES



CURRENT API 5DP RELEASE ANCHORS

Weld-zone hardness	E / X / G / S: no surface hardness above 37 HRC; through-wall weld-zone mean also capped at 37 HRC.
Tool-joint hardness	Non-SS tool-joint box: 285-341 HBW. Heat-control hardness record required for each steel heat used.
Wet fluorescent MPI	Entire outside weld-zone surface for transverse imperfections. Particle concentration checked every 8 h or shift change.
UV intensity at surface	Minimum 1000 microW/cm2 at 365-370 nm under the referenced API 5DP errata.

WELD → **INSPECT** → **REWORK IF REQUIRED** → **REINSPECT** → **RELEASE**

WELD-ZONE RELEASE CONTROLS

Control	Shop-floor operation	Recorded evidence
Alignment	Measure pipe-body / tool-joint concentricity after welding	Alignment result
Weld profile	Inspect flash removal and transition shape	Visual record
Hardness	Read across body - weld - tool-joint side when specified	Values / traverse
NDT	Inspect weld and adjacent transition per ITP	Method + coverage + result
Rework	Identify grinding, repair or local correction	Rework record
Reinspection	Repeat the affected inspection after rework	New acceptance result

MINIMUM WELD-ZONE EVIDENCE

- Weld-lot identification
- Joint number
- Alignment result
- Hardness result when required
- NDT method + coverage
- Rework + reinspection status

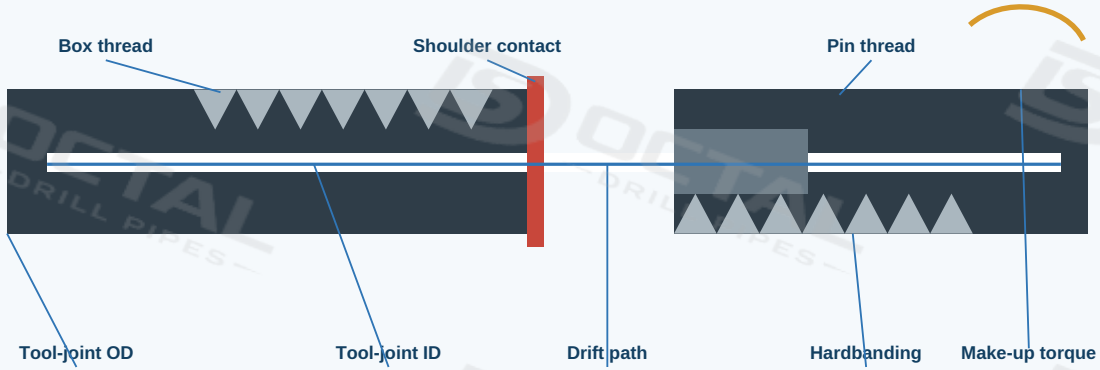
A repaired joint does not retain its original release status automatically.

Data anchors: API Spec 5DP Addendum 1 (Jan 2025) and Errata 1-3.

Connection Acceptance Is Separate from Pipe-Body Grade

X95 or G105 body strength does not override thread geometry, shoulder condition, tool-joint wear or drift clearance.

PIN-AND-BOX CONNECTION REVIEW



THE COMPLETE JOINT IS LIMITED BY THE WEAKEST VERIFIED COMPONENT

A correct grade marking does not compensate for:

- Wrong connection geometry
- Excessive tool-joint wear
- Shoulder damage / poor contact
- Unverified gauge record
- Failed drift clearance
- Incorrect make-up torque

CONNECTION INSPECTION MATRIX

Inspection point	Actual check	Acceptance meaning
Tool-joint OD	Measure remaining outside diameter	Wear allowance + capacity
Tool-joint ID	Measure bore diameter	Hydraulics + drift clearance
Pin gauge	Apply specified pin gauge	Thread geometry
Box gauge	Apply specified box gauge	Mating geometry
Shoulder face	Inspect contact, damage and refacing	Torque transfer
Make-up torque	Use approved value for actual connection	Avoid under/over-torque
Drift test	Pass specified mandrel through complete bore	Internal clearance
Hardbanding	Inspect location, cracks and wear	Tool-joint wear condition

CONNECTION RELEASE GATE

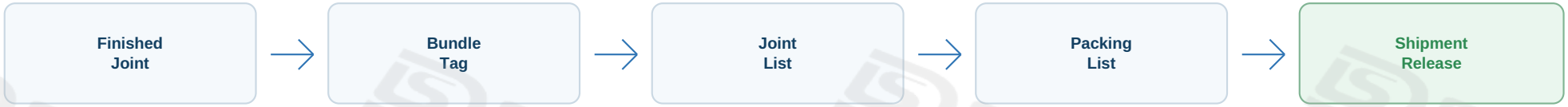
1. Confirm connection designation
2. Match current drawing / gauge basis
3. Measure OD, ID and shoulder
4. Verify gauge and drift records
5. Apply approved make-up torque
6. **Release only after rework reinspection**

NC50 marking alone does not prove equal OD, ID, torsional ratio or make-up torque.

Threading / gauging basis: API Spec 7-2, 2nd Ed., including Addendum 3 effective 1 Apr 2026.

Final Release Reconciles the Physical Joint with the Shipment File

The release decision is made on the finished joint and bundle - not on a standalone certificate.



FINAL RELEASE RECONCILIATION

Final release point	What must match
Joint marking	Grade, size, nominal weight, range, connection and joint number
Pipe-body record	Heat number, chemistry and actual mechanical test results
Assembly record	Tool-joint heat, friction-weld lot and weld-zone inspection
Connection record	OD, ID, pin/box gauges, shoulder and drift result
Surface condition	Hardbanding, coating, protectors and handling damage
Shipment record	Joint number, bundle number, quantity and packing-list entry

CONDITIONS THAT STOP SHIPMENT RELEASE

- H Grade marking does not match the MTC
- H Pipe-body or tool-joint heat number is missing
- H Weld / thread rework has no documented reinspection
- H Tool-joint OD, ID or drift differs from approved data
- H Gauge record cannot be linked to the connection batch
- H Packing-list quantity does not match the physical bundle
- H Joint numbers are missing from the bundle record
- H Report says only "passed" without identifying tested material

RELEASE ONLY WHEN

OK

Physical marking matches records | Grade is supported by actual results | Weld and connection inspections are complete | Rework is reinspected | Joint, bundle and packing list agree

SAMPLE FINAL STATUS

Joint JNT-000184 | G105 | NC50
Body heat linked | Weld NDT accepted
Gauge + drift accepted | Bundle B-12 matched

A visible X95 or G105 stencil supports identification, but conformity is proven by the linked physical joint, inspection status and shipment record.

Refs: API Spec 5DP 2nd Ed. + 2025 updates; ISO 11961:2018; API Spec 7-2 2nd Ed. + Add. 3; project PO/ITP.