

OCTAL DRILL PIPES

API Drill Pipe Connections

Thread Types, Tool Joint Dimensions
and Selection Reference

API 5DP

Drill pipe body, tool-joint and assembly product requirements

API 7-2

Rotary shouldered connection threading, gauges and gauging practice

Selection

Connection designation, OD / ID and drill-string compatibility

Inspection

Thread, shoulder, dimensional and gauge verification

Engineering purpose

A data-led reference for connection identity, selection, compatibility, gauging and inspection. It distinguishes drill pipe tool joints from ordinary pipe-thread tapping practice.



API 5DP controls drill pipe product requirements; API 7-2 controls rotary shouldered connection threading and gauging.

1. Applicable Standards

API Specification 5DP

2nd Edition, June 2020
Addendum 1: Jan 2025 | Errata 3: Mar 2025

Product requirements for drill pipe, tool joints and drill pipe assemblies.

API Specification 7-2

Threading and Gauging of Rotary
Shouldered Connections | 2nd Edition
Addendum 3: Sep 2025

Thread dimensions, connection gauges,
gauging practice and connection inspection.

Reference	Technical scope	Primary use
API 5DP	Pipe body, upset ends, weld-on tool joints, drill pipe assemblies, material and inspection requirements	Product manufacture and acceptance
API 7-2	Rotary shouldered connection thread geometry, gauges, gauging and inspection	Connection machining and verification

2. Drill Pipe Assembly Overview



3. What Each Standard Controls

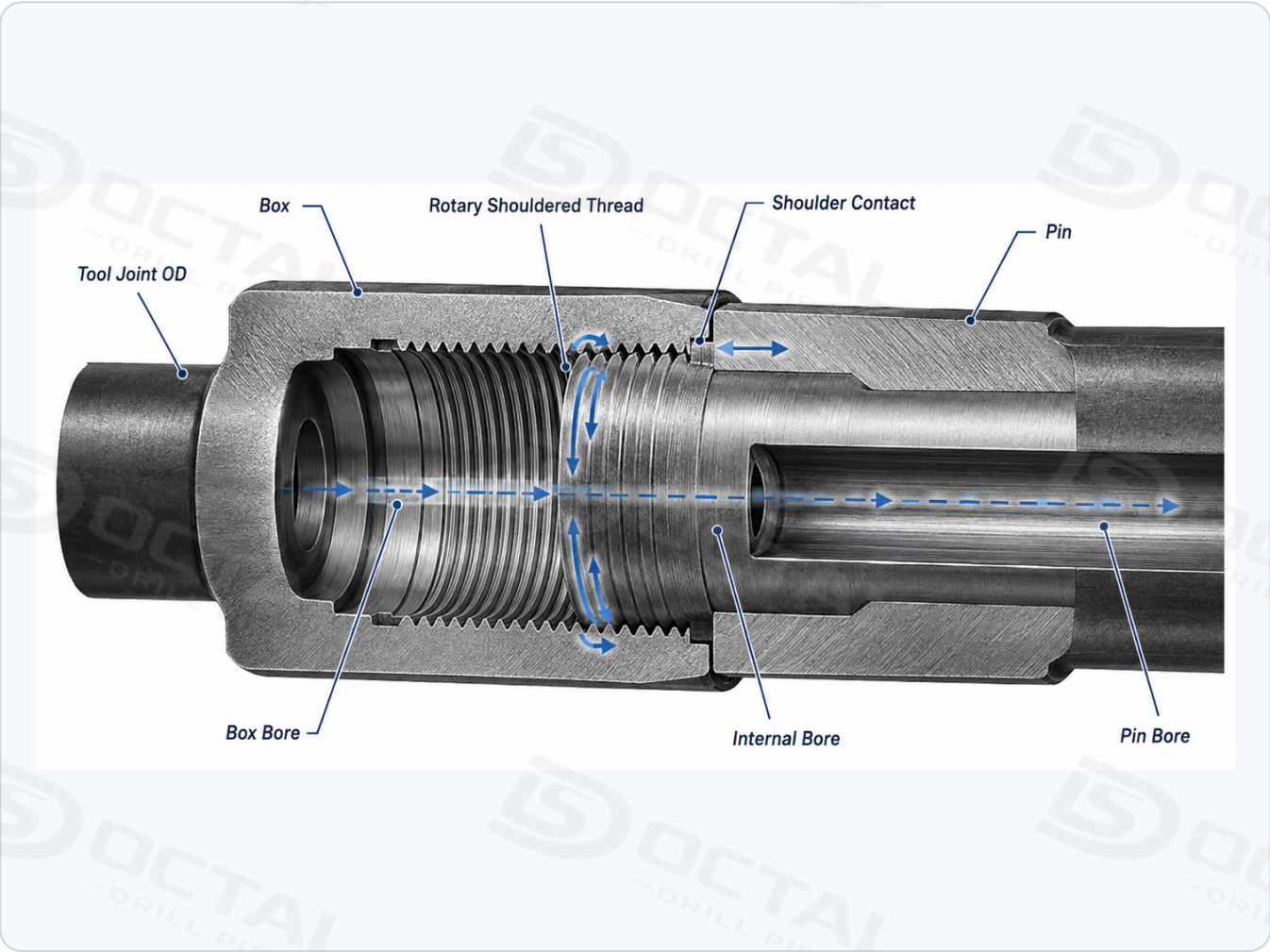
Element	Primary reference
Drill pipe body	API 5DP
Upset ends / weld zone	API 5DP
Tool joint product requirements	API 5DP
Rotary shouldered thread form	API 7-2
Thread gauges and gauging	API 7-2
Connection identity / compatibility	API 7-2 + purchase specification

PURCHASE CONTROL

Specify the exact connection designation together with drill pipe size, grade and tool-joint geometry. Avoid a generic “API thread” description.

Realistic cutaway: use controlled API 7-2 data and approved drawings for actual dimensions and gauge acceptance.

1. Pin-Box Rotary Shouldered Connection



2. Dimension & Condition Fields

Field	Why it matters
Connection designation	Controls thread form and mating compatibility.
Tool joint OD	External geometry, handling clearance and available section.
Tool joint ID / bore	Internal flow area and hydraulic passage.
Pin / box geometry	Must match the specified rotary shouldered connection.
Shoulder faces	Make-up interface; surface condition and geometry affect proper assembly.
Thread condition	Wear, deformation or galling can impair connection integrity.
Gauge acceptance	Verifies the specified connection geometry.

DRAWING CONTROL

The cutaway is explanatory, not a manufacturing drawing. Dimensions, taper, thread form, gauges and acceptance criteria must come from controlled API 7-2 data and the approved product drawing.

NC, IF and FH are rotary shouldered connection designations; they are not ordinary NPT-style pipe threads.

1. Connection Families



NC Series

Numbered connection family used widely for rotary shouldered drilling connections.



IF

Internal Flush designation; several commonly encountered sizes have NC equivalents.



FH

Full Hole designation; relationship and status depend on the exact size.

2. Published Interchangeability Reference

Requested / legacy	Equivalent NC
2-3/8 IF	NC26
2-7/8 IF	NC31
3-1/2 IF	NC38
4 FH	NC40
4 IF	NC46
4-1/2 IF	NC50

DATA CONTROL

Use the current controlled API 7-2 for complete dimensions, gauges and acceptance requirements.

3. Compatibility Is Not Visual Similarity

- Physical make-up does not prove service compatibility.
- Pin length, taper, pitch-diameter relationships and shoulder geometry can differ between connection designs.
- For replacement orders, verify the designation against purchase specifications, product marking and controlled drawings.
- For crossovers or mixed strings, confirm both mating ends before shipment or field use.

Select the connection as part of the complete drill-string system, not by thread name alone.

1. Purchase / Engineering Inputs

Selection item	What must be confirmed
Drill pipe OD	Outside diameter required for the drill string.
Wall / nominal weight	Pipe-body section and weight designation.
Pipe grade	Mechanical grade and service requirement.
Length / range	Required drill pipe length grouping.
Tool joint OD	External geometry, clearance and wear allowance.
Tool joint ID	Internal flow area and hydraulic compatibility.
Connection designation	Exact NC / IF / FH / other controlled designation.
Drill-string compatibility	Existing pipe, subs, crossover and BHA connections.
Operating duty	Torque, axial load, fatigue exposure and drilling environment.

INPUT CHECK

Review the drill pipe OD, weight designation, grade, tool-joint OD / ID, exact connection designation and drill-string compatibility together. Selecting by thread name alone can cause procurement mismatch.

2. Selection Logic



Connection selection begins with the drilling requirement, then resolves the pipe body, tool-joint geometry, exact connection designation and compatibility with the rest of the string.

1 Drilling requirement
Hole profile and operating conditions

2 Pipe body
OD, wall / weight, grade and range

3 Tool joint geometry
OD, ID, upset and weld configuration

4 Connection identity
Exact rotary shouldered designation

5 Compatibility
Mating pipe, subs, crossover and BHA

6 Final verification
Controlled drawing and API 7-2 gauging

SPECIFICATION RULE

State the complete drill pipe and mating-connection requirements. A connection name alone is insufficient for procurement or replacement.

Verify connection identity, surface condition, dimensions, gauge acceptance and traceability before release.

1. Inspection Areas



2. Verification Checklist

Area	Verification focus
Threads	Wear, dents, deformation, cracks, galling and thread damage.
Shoulder	Contact-face condition and damage at the make-up interface.
Pin / box	Mechanical damage, connection identity and service condition.
OD / ID	Tool-joint dimensions against the approved product specification.
Gauging	Applicable API 7-2 gauge verification for the specified connection.
Identification	Connection designation, traceability and product marking.
Records	Inspection result, release status and dimensional records.

RELEASE PACKAGE

Recommended record set: connection designation, dimensional checks, gauge result, visual condition, product traceability and release status.

3. Practical Inspection Activities



Thread gauge check



Shoulder inspection



OD / ID measurement



Make-up / fit check

4. Primary References

API Specification 5DP - Drill Pipe
2nd Edition, June 2020; Addendum 1 Jan 2025;
Errata 3 Mar 2025.

API Specification 7-2
2nd Edition; Addendum 3 Sep 2025.