# Special Threaded Drill Pipe Connection Guide

Standards, connection options, grade selection and purchase data for special threaded drill pipe orders.

This guide helps buyers define special threaded drill pipe orders before production. It is intended for procurement and engineering review where connection compatibility, tool joint dimensions, thread gauging and rig-side acceptance are critical.

## 1. Standards and Connection Basis

| Standard / Document | What It Controls | How Buyers Should Use It |
|---|---|---|
| API 5DP / ISO 11961 | Steel drill pipe with upset pipe-body ends and weld-on tool joints for drilling and production operations; PSL-1, PSL-2 and PSL-3 are covered by ISO 11961. | Use for pipe body, grade, PSL, tool joint delivery and traceability requirements. |
| API 7-2 | Dimensional requirements for rotary shouldered connections and thread gauges. | Use for standard rotary shouldered thread inspection and gauge control. |
| API RP 7G / project basis | Drill stem performance properties and operating limit considerations. | Use as design reference for drill string selection, not as a substitute for project engineering review. |
| Customer drawing / connection data | Special thread profile, tool joint geometry, shoulder design, gauge basis and make-up torque reference. | Mandatory for non-standard, high-torque, double-shoulder or proprietary connection requirements. |

## 2. Common Sizes, Grades and Length Ranges

| Category | Common Reference | Procurement Note |
|---|---|---|
| OD range | Common drill pipe sizes include 2 3/8 in, 2 7/8 in, 3 1/2 in, 4 in, 4 1/2 in, 5 in, 5 1/2 in and 6 5/8 in. | Final OD / wall thickness must match the drilling program and tool joint connection. |
| Grades | E75, X95, G105 and S135 are common API drill pipe grades. | Higher strength should be reviewed together with torque, dogleg severity, fatigue and connection limits. |
| Length ranges | R1: 18-22 ft; R2: 27-30 ft; R3: 38-45 ft are commonly used API range references. | Receiving inspection should match length range, marking, packing list and MTC. |
| Upset types | IU, EU and IEU are common upset configurations depending on design and order requirement. | Upset type affects pipe body/tool joint transition and should be confirmed before ordering. |
| Tool joint | Pin and box tool joints with specified OD, ID, length, tong space and connection type. | Tool joint geometry must match rig, subs, collars and other string components. |

# 3. Drill Pipe Grade Reference

| Grade | Typical Minimum Yield Strength | Selection Logic |
|---|---|---|
| E75 | 75 ksi | Conventional and lighter-duty drilling where load demand is moderate. |
| X95 | 95 ksi | Medium-depth wells or drilling strings requiring higher strength than E75. |
| G105 | 105 ksi | Deeper wells, higher rotary load and more demanding drilling conditions. |
| S135 | 135 ksi | High-load drilling, deep wells, horizontal wells and applications requiring higher tensile and torsional capacity. |

# 4. Connection Options and Selection Logic

| Connection Option | Typical Use | What to Confirm |
|---|---|---|
| NC series | Common rotary shouldered connections used across many drill pipe sizes. | NC size, tool joint OD/ID, gauge result, shoulder condition and compatibility with existing string. |
| FH / IF / REG | Used where existing drill string, subs, motors or rig equipment require these connection families. | Exact thread size, pin/box configuration and gauge basis. |
| High-torque connection | Reviewed for hard formations, long lateral sections and higher torsional demand. | Make-up torque basis, connection owner data, tool joint strength and rig torque capacity. |
| Double-shoulder connection | Used when additional shoulder contact is needed to improve load distribution and torque capacity. | Primary / secondary shoulder condition, gauge method and make-up procedure. |
| Drawing-based special thread | Used when customer provides proprietary or non-standard connection design. | Latest drawing revision, thread profile, gauge, torque data and inspection criteria. |

Selection rule: The correct connection is not chosen by name alone. Review the drilling program, existing string, tool joint OD/ID, dogleg severity, torque demand, rig equipment and gauge requirement before production.

# 5. Application-Based Selection Notes

| Application | Connection / Product Focus |
|---|---|
| Directional and horizontal wells | Stable shoulder contact, controlled make-up and connection fatigue resistance through build sections and long laterals. |
| High-torque drilling | High-torque or double-shoulder connections may be reviewed when connection torque is the limiting point. |
| Deep / extended-reach wells | Grade, tool joint size, connection type, hardbanding and internal coating should be selected as one package. |
| Workover / existing string compatibility | Pin/box connection, tool joint dimensions and gauge basis should match existing subs, collars, jars or rig tools. |

| Application | Connection / Product Focus |
|---|---|
| Hardbanding / internal coating service | Hardbanding position, coating coverage and thread protection must be confirmed before shipment release. |

# 6. Purchase Order Checklist

| Required PO Data | Details to Provide |
|---|---|
| Pipe body | OD, wall thickness, steel grade, length range, upset type and PSL when applicable. |
| Connection | Connection family, exact size, pin/box arrangement, special thread drawing or connection data sheet. |
| Tool joint | Tool joint OD, ID, length, tong space, shoulder type and special geometry if required. |
| Torque / gauge basis | Make-up torque reference, thread gauge requirement and acceptance criteria. |
| Options | Hardbanding type and position, internal coating, thread protectors, marking and packing requirement. |
| Inspection | Thread gauging, MPI/PT, dimensional report, TPI, photographs and document package. |
| Shipment records | MTC, inspection records, packing list, pipe marking photos and bundle identity. |

Reference basis: API 5DP / ISO 11961, API 7-2, API RP 7G / project design basis and customer-approved connection data. Exact dimensions, torque and gauge values should follow the latest applicable standard, drawing or connection owner data.