

DRILL PIPE DATA SHEET
DRILL PIPE: 3 1/2" EU by 13.30 lb/ft by Grade S135 by Range 2 (31.5 ft)
TOOL JOINT: 4 7/8" OD by 2 9/16" ID by TSDS38 (135 ksi SMYS)

| DRILL PIPE BODY DIMENSIONAL DATA | | |
|---|-------|-------------------|
| | NEW | PREMIUM (80% RBW) |
| OD (in) | 3.500 | 3.353 |
| ID, Ref (in) | 2.764 | 2.764 |
| Wall Thickness (in) | 0.368 | 0.294 |
| Cross Sectional Area (in ²) | 3.621 | 2.829 |
| Polar Section Modulus, J/c (in ³) | 5.144 | 3.982 |
| Section Modulus, I/c (in ³) | 2.572 | 1.991 |

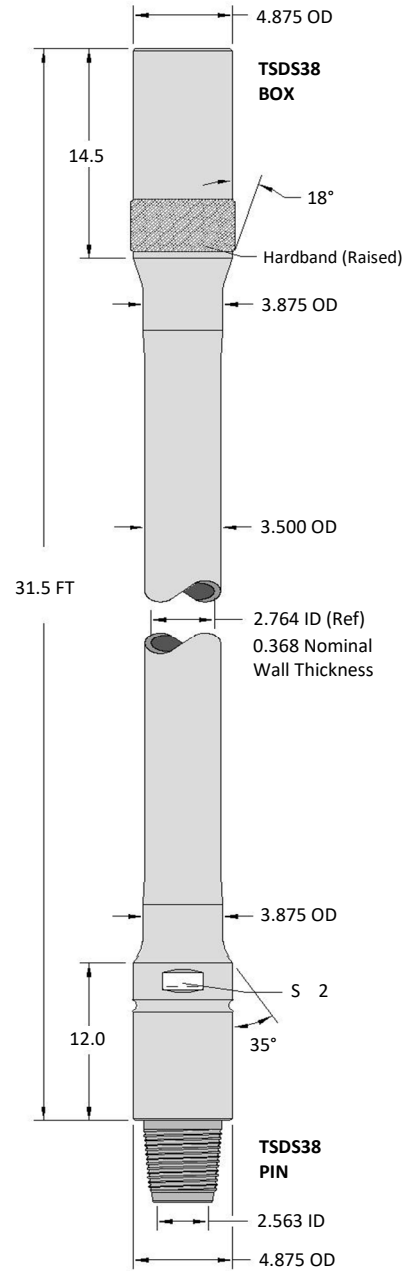
Premium class values based on a minimum wall thickness equal to 80% of New drill pipe body nominal wall thickness, reference API RP 7G-2.

| DRILL PIPE BODY PERFORMANCE PROPERTIES | | |
|--|---------|-------------------|
| | NEW | PREMIUM (80% RBW) |
| Tensile Yield (lb) | 488,825 | 381,870 |
| Torsional Yield (ft-lb) | 33,392 | 25,850 |
| Collapse Pressure (psi) | 25,404 | 21,626 |
| Internal Yield Pressure (psi) | 24,840 | 22,711 |
| Material Yield Strength (psi) | 135,000 | |

Drill pipe body performance properties are based on API RP 7G. Class New drill pipe body data is for reference only and is not intended for drill string design purposes.

| TOOL JOINT DATA (New) | | |
|---|----------------|-----------------|
| Connection Size | TSDS38 | |
| OD (in) | 4.875 | |
| ID (in) | 2.563 | |
| Box Tool Joint OD Length (in) | 14.5 | |
| Pin Tool Joint OD Length (in) | 12.0 | |
| Connection Bevel Diameter (in) | 4.578 | |
| Material Yield Strength (psi) | 135,000 | |
| Thread Compound Friction Factor | 1.0 (a) | 1.15 (b) |
| Recommended Make-Up Torque (ft-lb) | 17,500 | 20,200 (c) |
| Max Make-Up Torque (ft-lb) | 20,400 | 23,500 (d) |
| Torsional Yield (ft-lb) | 29,200 | |
| Torsional Strength Ratio, TJ/DPB | 0.87 | |
| Approximate Tension to Yield Pin at Recommended Make-Up Torque (lb) | 549,000 | |
| Approximate Tension to Yield Pin at Max Make-Up Torque (lb) | 413,000 | |
| Tool Joint Tensile Yield (lb) | 714,100 | |
| Balanced OD (in) | 4.781 | |

- (a) Make-Up Torque values shown under column 1.0 are based on using a 1.0 friction factor thread compound (0.08 coefficient of friction).
- (b) Make-Up Torque values shown under column 1.15 have been adjusted based on using a 1.15 friction factor thread compound. The make-up torque values are only applicable when using a thread compound rated by the manufacturer to have a 1.15 friction factor.
- (c) Recommended Make-Up Torque is based on 60% of the connection torsional yield, ref. API RP 7G.
- (d) Max Make-Up Torque is based on 70% of the connection torsional yield. It is the maximum make-up torque that can be applied to the connection to prevent downhole make-up, reference IADC Drilling Manual. Never exceed Max Make-Up Torque.



| ASSEMBLY DATA (New) | | | | | | | |
|---------------------|---------|--------------------|----------|----------------------------------|----------|----------------|--|
| Weight (Approx.) | | Capacity (Approx.) | | Displacement Open Ends (Approx.) | | Drift Diameter | Assembly Length Shld'r to Shld'r (Approx.) |
| (lb/Joint) | (lb/ft) | (US gallon/ft) | (BBL/ft) | (US gallon/ft) | (BBL/ft) | (in) | (ft) |
| 499 | 15.85 | 0.2956 | 0.0070 | 0.2422 | 0.0058 | 2.438 | 31.5 |

Assembly data based on TSC 95% RBW New drill pipe nominal dimensions and no internal plastic coating. Conversion Factor: 1 BBL= 42 US gallons

Notes:

1. All data is calculated based on standard methods. No safety factor applied.
2. Premium Class drill pipe body data is based on a minimum wall thickness equal to 80% of New drill pipe nominal wall thickness, reference API RP 7G-2.
3. Drawing is for reference purposes only, not to scale, and based on New drill pipe nominal dimensions, units of inches unless otherwise indicated.
4. Caution: Approximate tension to yield pin at Max Make-Up Torque is less than New drill pipe body tensile yield.

| Tool Joint Make-Up Torque TSDS38 x 2.563" ID (135 ksi SMYS) 1.0 Friction Factor Thread Compound | | | |
|---|--|------------------------------------|------------------------------|
| Tool Joint OD (in) | Recommended Make-Up Torque (1) (2) (ft-lb) | Max Make-Up Torque (1) (3) (ft-lb) | Torsional Yield Ref. (ft-lb) |
| 4.875 | 17,500 | 20,400 | 29,200 |
| 4.750 | 16,900 | 19,700 | 28,200 |
| 4.625 | 14,500 | 16,800 | 24,100 |
| 4.594 | 13,900 | 16,100 | 23,100 |

(1)

| Combined Torque and Tension to Yield Drill Pipe Body Premium Class (80% RBW) 3 1/2" EU x 13.30 lb/ft x Grade S135 | |
|---|----------------------------------|
| Operational Torque (ft-lb) | Drill Pipe Body Max Tension (lb) |
| 0 | 381,870 |
| 1,000 | 381,500 |
| 2,000 | 380,700 |
| 3,000 | 379,200 |
| 4,000 | 377,200 |
| 5,000 | 374,600 |
| 6,000 | 371,400 |
| 7,000 | 367,600 |
| 8,000 | 363,100 |
| 9,000 | 357,900 |
| 10,000 | 352,100 |
| 11,000 | 345,500 |
| 12,000 | 338,200 |
| 13,000 | 330,000 |
| 14,000 | 321,000 |
| 15,000 | 311,000 |
| 16,000 | 299,900 |

(5)

Caution: Operational (rotating) torque should never exceed 80% of the connection make-up torque, reference IADC Drilling Manual.

| Tool Joint Make-Up Torque TSDS38 x 2.563" ID (135 ksi SMYS) 1.15 Friction Factor Thread Compound | | |
|--|--|------------------------------------|
| Tool Joint OD (in) | Recommended Make-Up Torque (4) (2) (ft-lb) | Max Make-Up Torque (4) (3) (ft-lb) |
| 4.875 | 20,200 | 23,500 |
| 4.750 | 19,400 | 22,600 |
| 4.625 | 16,600 | 19,400 |
| 4.594 | 16,000 | 18,600 |

(4)

| Estimated Elevator Hoist Capacity (lb) | | |
|--|--------------------------------|--------------------------------|
| Tool Joint OD (in) | 3.969" Dia. Assumed Elev. Bore | 4.000" Dia. Assumed Elev. Bore |
| 4.875 | 692,400 | 670,900 |
| 4.594 | 462,300 | 440,800 |

(6)

Notes:

- Make-Up Torque values are based on 1.0 friction factor thread compound (0.08 coefficient of friction).
- Recommended Make-Up Torque is based on 60% of the connection torsional yield, ref. API RP 7G.
- Max Make-Up Torque is based on 70% of the connection torsional yield. It is the maximum make-up torque that can be applied to the connection to prevent downhole make-up, reference IADC Drilling Manual. Never exceed Max Make-Up Torque.
- Make-Up Torque values have been adjusted based on using a 1.15 friction factor thread compound. The make-up torque values are only applicable when using a thread compound rated by the manufacturer to have a 1.15 friction factor.
- Premium class drill pipe body based on 80% remaining pipe body wall and other requirements specified in API RP 7G-2. Drill pipe body combined torque and tension based on API RP 7G, no safety factor applied.
- Estimated elevator hoist capacity is for reference only and based on tool joint projected taper area, 110,000 psi SMYS and no safety factor. User is advised to contact their elevator manufacturer for elevator hoist capacity versus tool joint OD.