

**Drill Pipe Performance Characteristics Sheet**

**TSC Drill Pipe**



**Patent: 9,885,214**  
**Pipe Size and Weight:** 5 19.50 IEU  
**Pipe Grade:** S-135  
**Range:** 2  
**Tool Joint:** 6 1/2 X 3 3/4 PTECH+™52



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**Pipe Body**

|  | <b>New-API</b> | <b>Premium</b> |
|--|----------------|----------------|
| OD (in)  | 5.000          | 4.855          |
| Wall Thickness (in)  | 0.362          | 0.290          |
| ID (in)  | 4.276          | 4.276          |
| Calculated Plain End weights (lbs/ft)  | 17.923         | 14.114         |
| <b>Note: Premium properties are calculated based on uniform OD and wall thickness.</b> |                |                |
| Cross sectional area pipe body (in <sup>2</sup> )                                      | 5.275          | 4.154          |
| Cross sectional area OD (in <sup>2</sup> )   | 19.635         | 18.514         |
| Cross sectional area ID (in <sup>2</sup> )   | 14.360         | 14.360         |
| Section Modulus (in <sup>3</sup> )   | 5.708          | 4.476          |
| Polar Section Modulus (in <sup>3</sup> )   | 11.415         | 8.953          |
| <b>New-API Premium</b>   |                |                |
| Torsional Strength (ft-lbs)  | 74,100         | 58,100         |
| Tensile Strength (lbs)   | 712,100        | 560,800        |
| 80% Torsional Strength (ft-lbs)  | 59,300         | 46,500         |
| Pressure Capacity (psi)  | 17,105         | 15,638         |
| Collapse Capacity (psi)  | 18,133         | 10,024         |

**Tool Joint**



**PTECH+™52**

OD (in) 6 1/2  
 ID (in) 3 3/4

**Tool Joint with a Material Yield Strength of 135000 psi**

Pin Tong length (in) 13  
 Box Tong length (in) 15

|  | <b>Friction Factor 1.0</b> | <b>1.15</b>   |
|--|----------------------------|---------------|
| <b>Torsional Strength (ft-lbs)</b>                                     | <b>91,100</b>              |               |
| <b>Severe Service Level Recommended Make-up Torque (ft-lbs)(70%)</b>   | <b>63,800</b>              | <b>73,400</b> |
| <b>Standard Service Level Recommended Make-up Torque (ft-lbs)(60%)</b> | <b>54,700</b>              | <b>62,900</b> |
| <b>Minimum Recommended Make-up Torque (ft-lbs)</b>                     | <b>43,000</b>              | <b>49,500</b> |

Balance OD (in) 6.429  
**Tensile Strength (lbs) 1,244,700**  
 Tool joint/Drill pipe torsional ratio (New pipe) 1.23  
 Tool joint/Drill pipe torsional ratio (Prem pipe) 1.57  
 Min OD for premium class (in) 6.155

Minimum make-up is based on shoulder separation caused by bending.

**Drill Pipe Assembly with PTECH+™52™ Tool Joint**      **Drill Pipe Bend Radius**

|                                 |       |  |        |
|---------------------------------|-------|--|--------|
| API Adjusted weight (lbs/ft)    | 22.99 | * These calculations are based on new pipe with nominal wall |        |
| Approximate length (ft)         | 31.50 | Based on Bending Stress (psi) at Pipe OD                     | 15,000 |
| API Fluid Displacement (gal/ft) | 0.352 | Radius of Curvature ( R ) (ft.) (@ OD of pipe)               | 416.7  |
| Fluid Capacity (gal/ft)         | 0.723 | BUR (dogleg) deg/100 ft.                                     | 13.8   |
| Drift Size                      | 3.625 |  |        |

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