

Drill Pipe Performance Characteristics Sheet



Patents 9,493,993
9,885,214

Pipe Size and Weight: 2 3/8 5.80 EU

Pipe Grade: S-135

Range: 2

Tool Joint: 3 1/16 X 1.805 PTECH24+

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Revision 6 12/2/2021

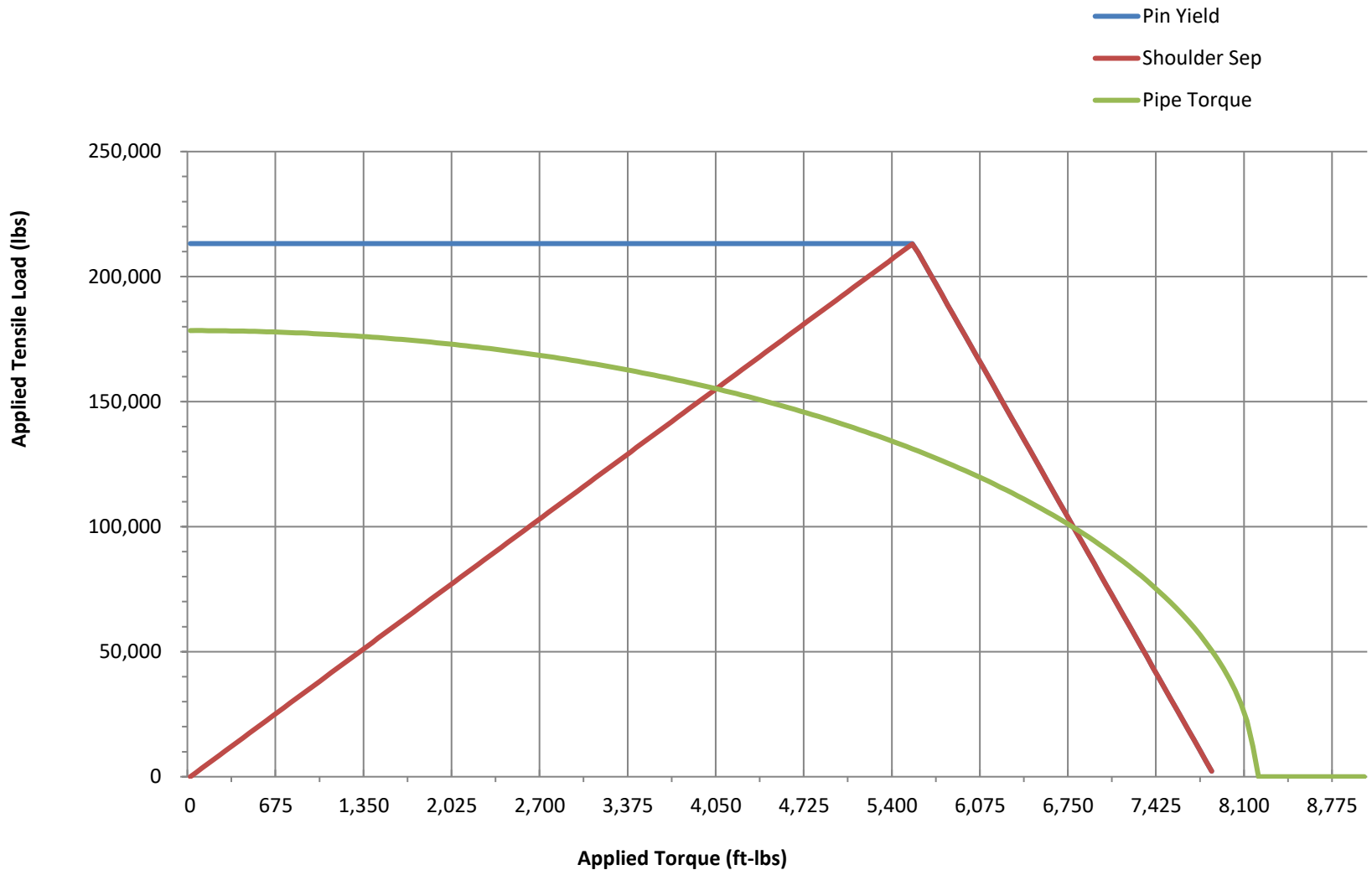
| Pipe Body | | | |
|--|----------------|-------------------|----------------|
| | New-API | New-95%RBW | Premium |
| OD (in) | 2.375 | 2.375 | 2.273 |
| Wall Thickness (in) | 0.254 | 0.273 | 0.203 |
| ID (in) | 1.867 | 1.829 | 1.867 |
| Calculated Plain End weights (lbs/ft) | 5.751 | 6.127 | 4.491 |
| Note: Premium properties are calculated based on uniform OD and wall thickness. | | | |
| Cross sectional area pipe body (in ²) | 1.692 | 1.803 | 1.322 |
| Cross sectional area OD (in ²) | 4.430 | 4.430 | 4.059 |
| Cross sectional area ID (in ²) | 2.738 | 2.627 | 2.738 |
| Section Modulus (in ³) | 0.813 | 0.853 | 0.629 |
| Polar Section Modulus (in ³) | 1.626 | 1.705 | 1.258 |
| | New-API | New-95%RBW | Premium |
| Torsional Strength (ft-lbs) | 10,600 | 11,100 | 8,200 |
| Tensile Strength (lbs) | 228,500 | 243,400 | 178,400 |
| 80% Torsional Strength (ft-lbs) | 8,500 | 8,900 | 6,600 |
| Pressure Capacity (psi) | 25,266 | 27,161 | 23,101 |
| Collapse Capacity (psi) | 25,788 | 27,473 | 21,976 |

| Tool Joint | |
|-----------------------------|---|
| PTECH+ CONNECTION | PTECH24+ |
| | OD (in) 3 1/16 |
| | ID (in) 1.805 |
| | Tool Joint with a Material Yield Strength of 135000 psi |
| | Pin Tong length (in) 7 |
| | Box Tong length (in) 10 |
| | Friction Factor 1.0 1.15 |
| | Torsional Yield Strength (ft-lbs) 7,850 9,000 |
| | Severe Service Recommended Make-up Torque (ft-lbs) [70%] 5,500 6,300 |
| | Standard Service Recommended Make-up Torque (ft-lbs) [60%] 4,700 5,400 |
| | Min Recommended Make-up Torque (ft-lbs) 3,900 4,500 |
| | Balance OD (in) 3.009 |
| | Tensile Strength (lbs) 217,600 |
| | Tool joint/Drill pipe torsional ratio (New pipe) 0.74 |
| | Tool joint/Drill pipe torsional ratio (95% New pipe) 0.71 |
| | Tool joint/Drill pipe torsional ratio (Prem pipe) 0.96 |
| | Min OD for premium class (in) 2.922 |

| Drill Pipe Assembly with PTECH+ Tool Joint | Drill Pipe Bend Radius | | | | | | | | | | | | | | |
|---|------------------------------|------|------------------------------|------|-------------------------|-------|---------------------------------|-------|---------------------------------|-------|-------------------------|-------|------------|-------|---|
| <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;">API Adjusted weight (lbs/ft)</td> <td style="text-align: right;">6.42</td> </tr> <tr> <td>95% Adjusted weight (lbs/ft)</td> <td style="text-align: right;">6.78</td> </tr> <tr> <td>Approximate length (ft)</td> <td style="text-align: right;">32.00</td> </tr> <tr> <td>95% Fluid Displacement (gal/ft)</td> <td style="text-align: right;">0.104</td> </tr> <tr> <td>API Fluid Displacement (gal/ft)</td> <td style="text-align: right;">0.098</td> </tr> <tr> <td>Fluid Capacity (gal/ft)</td> <td style="text-align: right;">0.139</td> </tr> <tr> <td>Drift Size</td> <td style="text-align: right;">1.711</td> </tr> </table> | API Adjusted weight (lbs/ft) | 6.42 | 95% Adjusted weight (lbs/ft) | 6.78 | Approximate length (ft) | 32.00 | 95% Fluid Displacement (gal/ft) | 0.104 | API Fluid Displacement (gal/ft) | 0.098 | Fluid Capacity (gal/ft) | 0.139 | Drift Size | 1.711 | <p>* These calculations are based on new pipe with nominal wall</p> <p style="text-align: right;">Based on Bending Stress (psi) at Pipe OD 15,000</p> <p style="text-align: right;">Radius of Curvature (R) (ft.) (@ OD of pipe) 197.9</p> <p style="text-align: right;">BUR (dogleg) deg/100 ft. 29.0</p> |
| API Adjusted weight (lbs/ft) | 6.42 | | | | | | | | | | | | | | |
| 95% Adjusted weight (lbs/ft) | 6.78 | | | | | | | | | | | | | | |
| Approximate length (ft) | 32.00 | | | | | | | | | | | | | | |
| 95% Fluid Displacement (gal/ft) | 0.104 | | | | | | | | | | | | | | |
| API Fluid Displacement (gal/ft) | 0.098 | | | | | | | | | | | | | | |
| Fluid Capacity (gal/ft) | 0.139 | | | | | | | | | | | | | | |
| Drift Size | 1.711 | | | | | | | | | | | | | | |

This Performance Sheet was generated by Nels Wickander.

For PTECH24+ 3 1/16 X 1.805 Tool Joint with a Material Strength of 135000 psi, using a Coefficient of Friction factor of 0.08 and a Safety Factor of 1.0. On Pipe: 2.375 5.80 S-135 Premium Class.



PTECH24+ 3 1/16 X 1.805 TOOL JOINT OD WEAR CURVE

