

Drill Pipe Performance Characteristics Sheet

PTECH Drilling Tubulars, LLC

Pipe Size and Weight: 4 1/2 16.60 IEU


Pipe Grade: S-135

Range: 2

Tool Joint: 5 1/4 X 3 PTECH43+

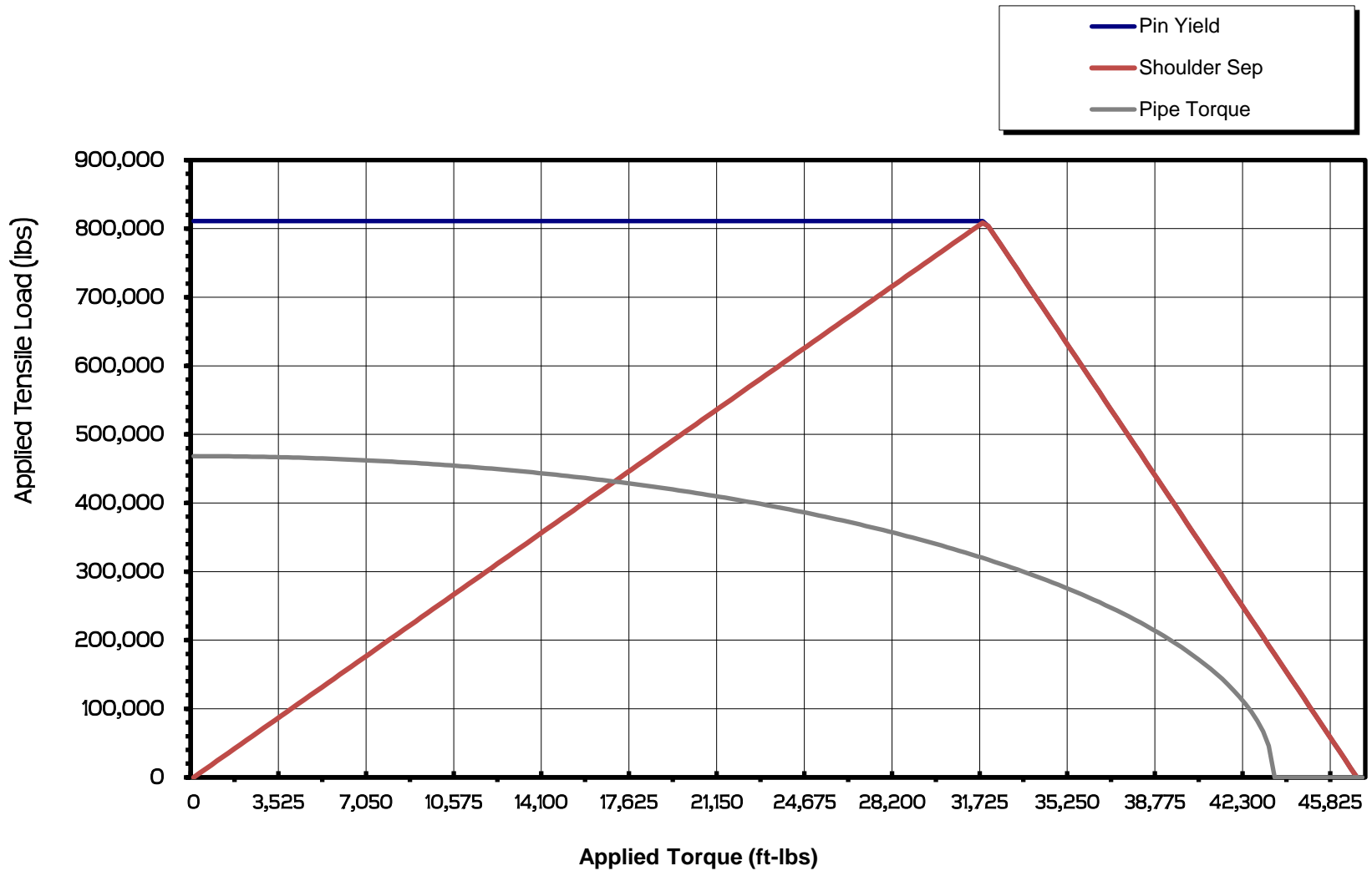
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Revision 2

Pipe Body			
	New-API	New-95%RBW	Premium
OD (in)	4.500	4.500	4.365
Wall Thickness (in)	0.337	0.362	0.270
ID (in)	3.826	3.775	3.826
Calculated Plain End weights (lbs/ft)	14.976	16.002	11.787
Note: Premium properties are calculated based on uniform OD and wall thickness.			
Cross sectional area pipe body (in ²)	4.407	4.709	3.469
Cross sectional area OD (in ²)	15.904	15.904	14.966
Cross sectional area ID (in ²)	11.497	11.195	11.497
Section Modulus (in ³)	4.271	4.514	3.347
Polar Section Modulus (in ³)	8.543	9.027	6.694
	New-API	New-95%RBW	Premium
Torsional Strength (ft-lbs)	55,500	58,600	43,500
Tensile Strength (lbs)	595,000	635,700	468,300
80% Torsional Strength (ft-lbs)	44,400	46,900	34,800
Pressure Capacity (psi)	17,693	19,019	16,176
Collapse Capacity (psi)	18,706	19,987	10,959
Tool Joint			
		PTECH43+ OD (in) 5 1/4 ID (in) 3 Tool Joint with a Material Yield Strength of 135000 psi Pin Tong length (in) 13 Box Tong length (in) 15 Torsional Strength (ft-lbs) 46,760 Max Recommended Make-up Torque (ft-lbs) 28,100 Min Recommended Make-up Torque (ft-lbs) 22,100 Balance OD (in) 5.251 Tensile Strength (lbs) 819,000 Tool joint/Drill pipe torsional ratio (New pipe) 0.84 Tool joint/Drill pipe torsional ratio (95% New pipe) 0.80 Tool joint/Drill pipe torsional ratio (Prem pipe) 1.07 Min OD for premium class (in) 4.969	
Minimum make-up is based on shoulder separation caused by bending.			
Drill Pipe Assembly with PTECH+ Tool Joint		Drill Pipe Bend Radius	
API Adjusted weight (lbs/ft)	18.11	* These calculations are based on new pipe with nominal wall	
95% Adjusted weight (lbs/ft)	19.06	Based on Bending Stress (psi) at Pipe OD	15,000
Approximate length (ft)	31.85	Radius of Curvature (R) (ft.) (@ OD of pipe)	375.0
95% Fluid Displacement (gal/ft)	0.291	BUR (dogleg) deg/100 ft.	15.3
API Fluid Displacement (gal/ft)	0.277		
Fluid Capacity (gal/ft)	0.572		
Drift Size	2.875		

TORQUE TENSION COMBINED LOAD CURVE

For PTECH43+ 5 1/4 X 3 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: 4.5 16.60 S-135 Premium Class.



PTECH43+ 5 1/4 X 3 TOOL JOINT OD WEAR CURVE

