

Drill Pipe Performance Characteristics Sheet



Patent: 9,885,214
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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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			
PTECH+		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
		Friction Factor	1.0 1.15
		Torsional Yield Strength (ft-lbs)	48,450 55,700
		Severe Service Recommended Make-up Torque (ft-lbs) [70%]	33,900 39,000
		Standard Service Recommended Make-up Torque (ft-lbs) [60%]	29,100 33,500
		Min Recommended Make-up Torque (ft-lbs)	22,900 26,300
		Balance OD (in)	5.251
		Tensile Strength (lbs)	819,000
		Tool joint/Drill pipe torsional ratio (New pipe)	0.87
		Tool joint/Drill pipe torsional ratio (95% New pipe)	0.83
		Tool joint/Drill pipe torsional ratio (Prem pipe)	1.11
		Min OD for premium class (in)	4.953

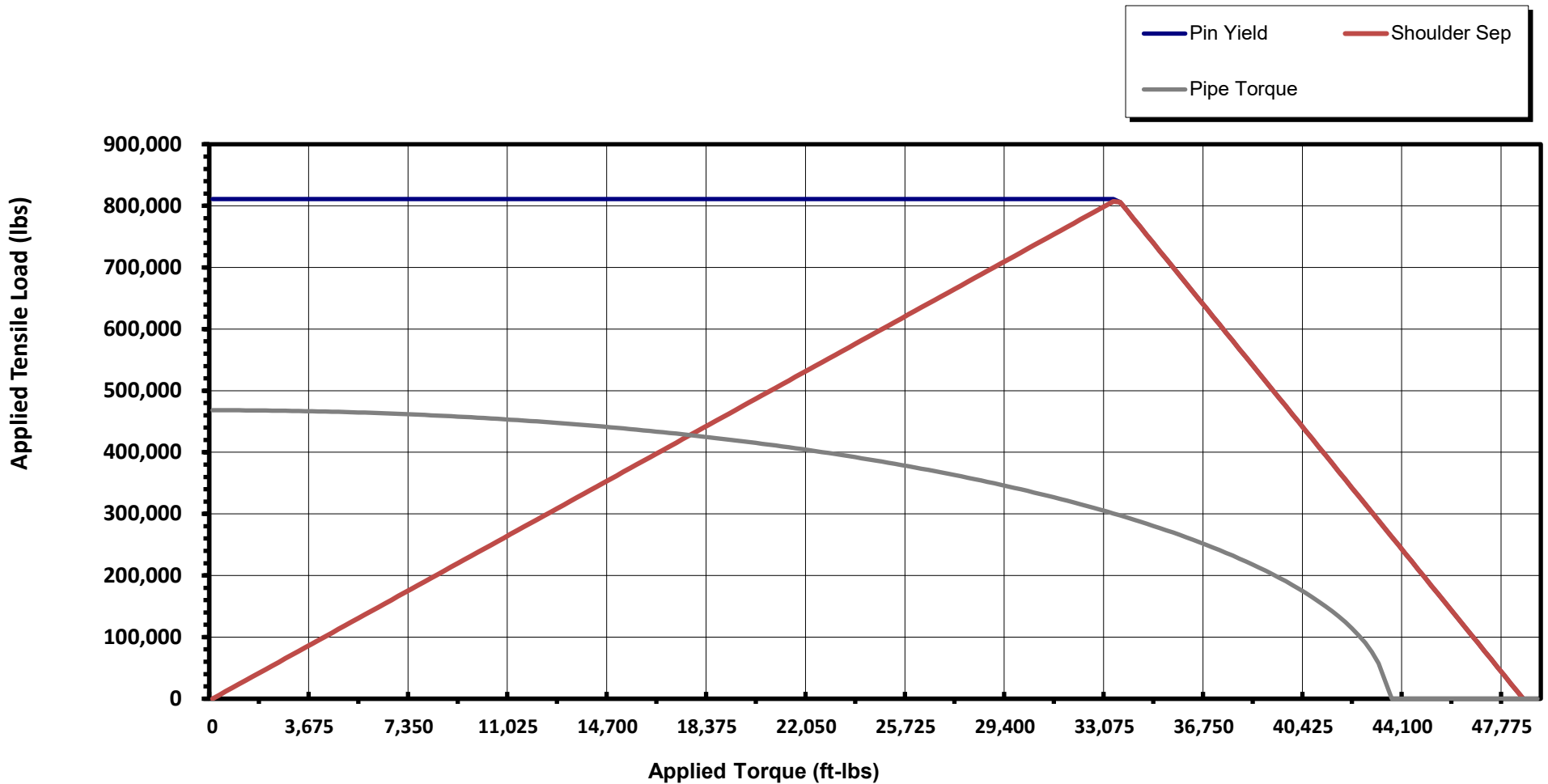
Minimum make-up is based on shoulder separation caused by bending.

Drill Pipe Assembly with PTECH+ Tool Joint			Drill Pipe Bend Radius	
API Adjusted weight (kg/m)(lbs/ft)	26.949	18.11	* These calculations are based on new pipe with nominal wall	
95% Adjusted weight (kg/m)(lbs/ft)	28.358	19.06		
Approximate length (M)(ft)	9.708	31.85		
%Fluid Displacement (CuM/M)(gal/ft)	0.00362	0.291	Based on Bending Stress (psi) at Pipe OD	15,000
PI Fluid Displacement CuM/M)(gal/ft)	0.00344	0.277	Radius of Curvature (R) (ft.) (@ OD of pipe)	375.0
Fluid Capacity (CuM/M)(gal/ft)	0.00710	0.572	BUR (dogleg) deg/100 ft.	15.3
Drift Size	73.03	2.875		

This Performance Sheet was generated by Nels Wickander.

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

