

Drill Pipe Performance Characteristics Sheet

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Patent: 9,885,214

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Pipe Size and Weight: 5 1/2 24.70 IEU
Pipe Grade: S-135
Range: 2
Tool Joint: 6 5/8 X 4 1/4 PTECH55+

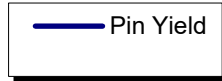
Pipe Body			
	New-API	New-95%RBW	Premium
OD (in)	5.500	5.500	5.334
Wall Thickness (in)	0.415	0.446	0.332
ID (in)	4.670	4.608	4.670
Calculated Plain End weights (lbs/ft)	22.527	24.068	17.728
Note: Premium properties are calculated based on uniform OD and wall thickness.			
Cross sectional area pipe body (in ²)	6.630	7.083	5.217
Cross sectional area OD (in ²)	23.758	23.758	22.346
Cross sectional area ID (in ²)	17.129	16.675	17.129
Section Modulus (in ³)	7.844	8.288	6.145
Polar Section Modulus (in ³)	15.688	16.575	12.290
	New-API	New-95%RBW	Premium
Torsional Strength (ft-lbs)	101,800	107,600	79,800
Tensile Strength (lbs)	895,000	956,200	704,300
80% Torsional Strength (ft-lbs)	81,400	86,100	63,800
Pressure Capacity (psi)	17,826	19,163	16,298
Collapse Capacity (psi)	18,836	20,124	11,172

Tool Joint	
PTECH+ CONNECTION	
PTECH55+	
OD (in)	6 5/8
ID (in)	4 1/4
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 Strength (ft-lbs)	86,400 99,400
Severe Service Recommended Make-up Torque (ft-lbs)[70%]	60,500 69,600
Standard Service Recommended Make-up Torque (ft-lbs)[60%]	51,800 59,600
Min Recommended Make-up Torque (ft-lbs)	40,800 46,900
Balance OD (in)	6.605
Tensile Strength (lbs)	1,147,500
Tool joint/Drill pipe torsional ratio (New pipe)	0.85
Tool joint/Drill pipe torsional ratio (95% New pipe)	0.80
Tool joint/Drill pipe torsional ratio (Prem pipe)	1.08
Min OD for premium class (in)	6.266

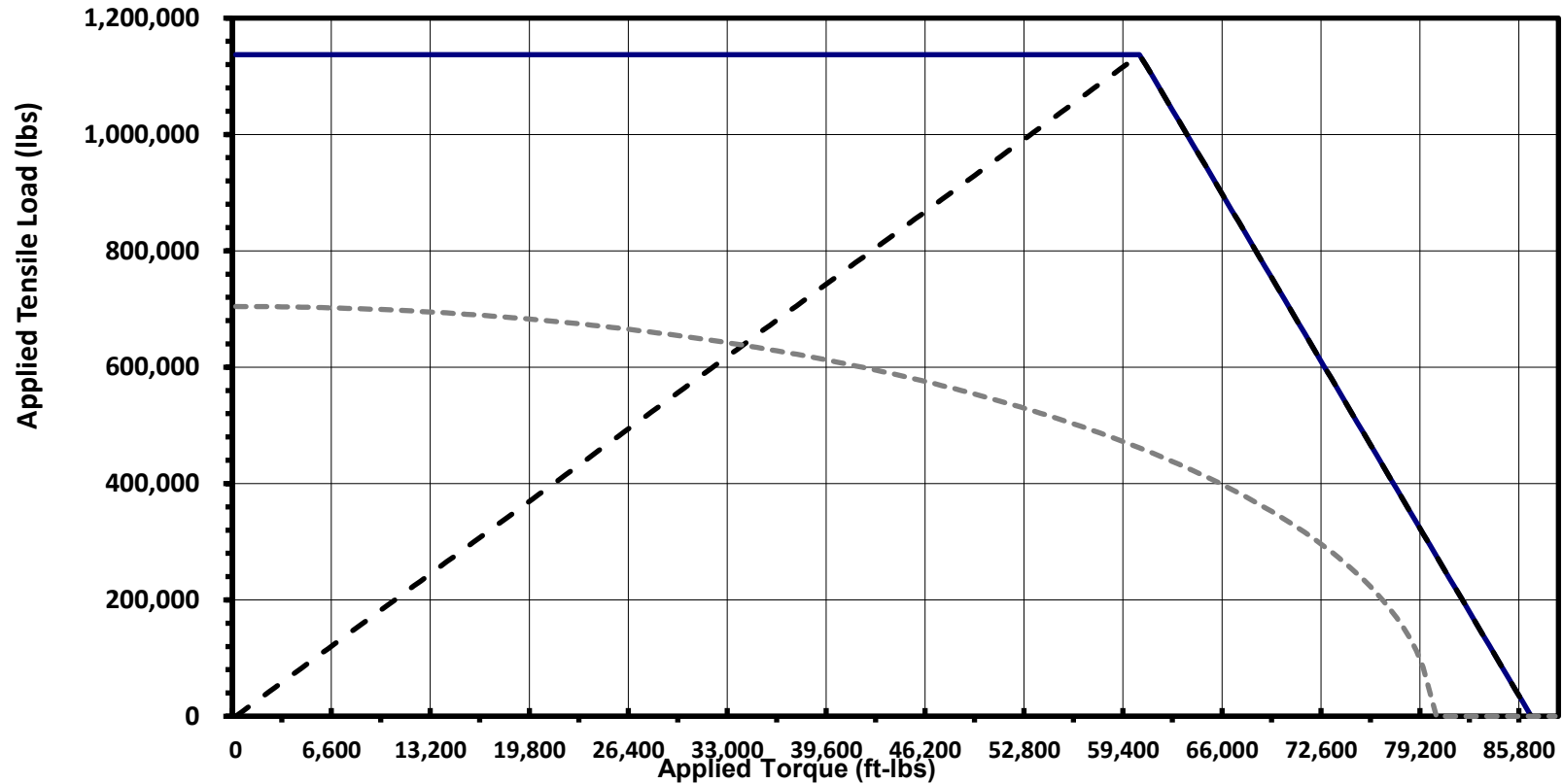
Minimum make-up is based on shoulder separation caused by bending.

Drill Pipe Assembly with PTECH55+ Tool Joint	Drill Pipe Bend Radius
API Adjusted weight (lbs/ft)	26.81
95% Adjusted weight (lbs/ft)	28.23
Approximate length (ft)	31.50
95% Fluid Displacement (gal/ft)	0.432
API Fluid Displacement (gal/ft)	0.410
Fluid Capacity (gal/ft)	0.867
Drift Size	4.125
* These calculations are based on new pipe with nominal wall	
Based on Bending Stress (psi) at Pipe OD	15,000
Radius of Curvature (R) (ft.) (@ OD of pipe)	458.3
BUR (dogleg) deg/100 ft.	12.5

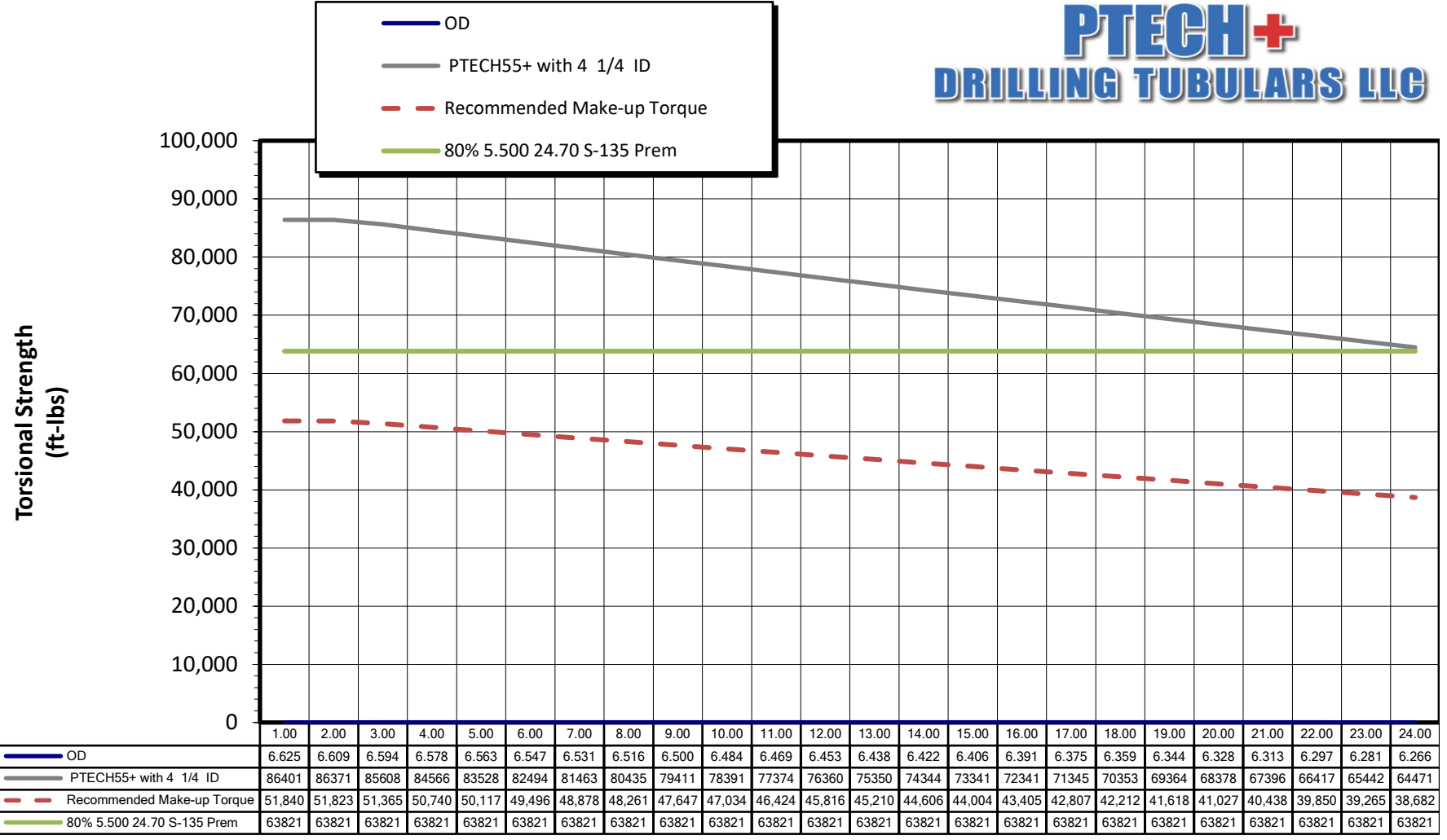
TORQUE TENSION COMBINED LOAD CURVE



For PTECH55+ 6 5/8 X 4 1/4 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: 5.5 24.70 S-135 Premium Class.



PTECH55+ 6 5/8 X 4 1/4 TOOL JOINT OD WEAR CURVE



Tool Joint Box OD (in.)