


### Drill Pipe Performance Characteristics Sheet

PTECH Drilling Tubulars, LLC

**Pipe Size and Weight:** 4 HWDP 0  
**Pipe Grade:** 0  
**Range:** 2  
**Tool Joint:** 4 15/16 X 2 9/16 PTECH39+

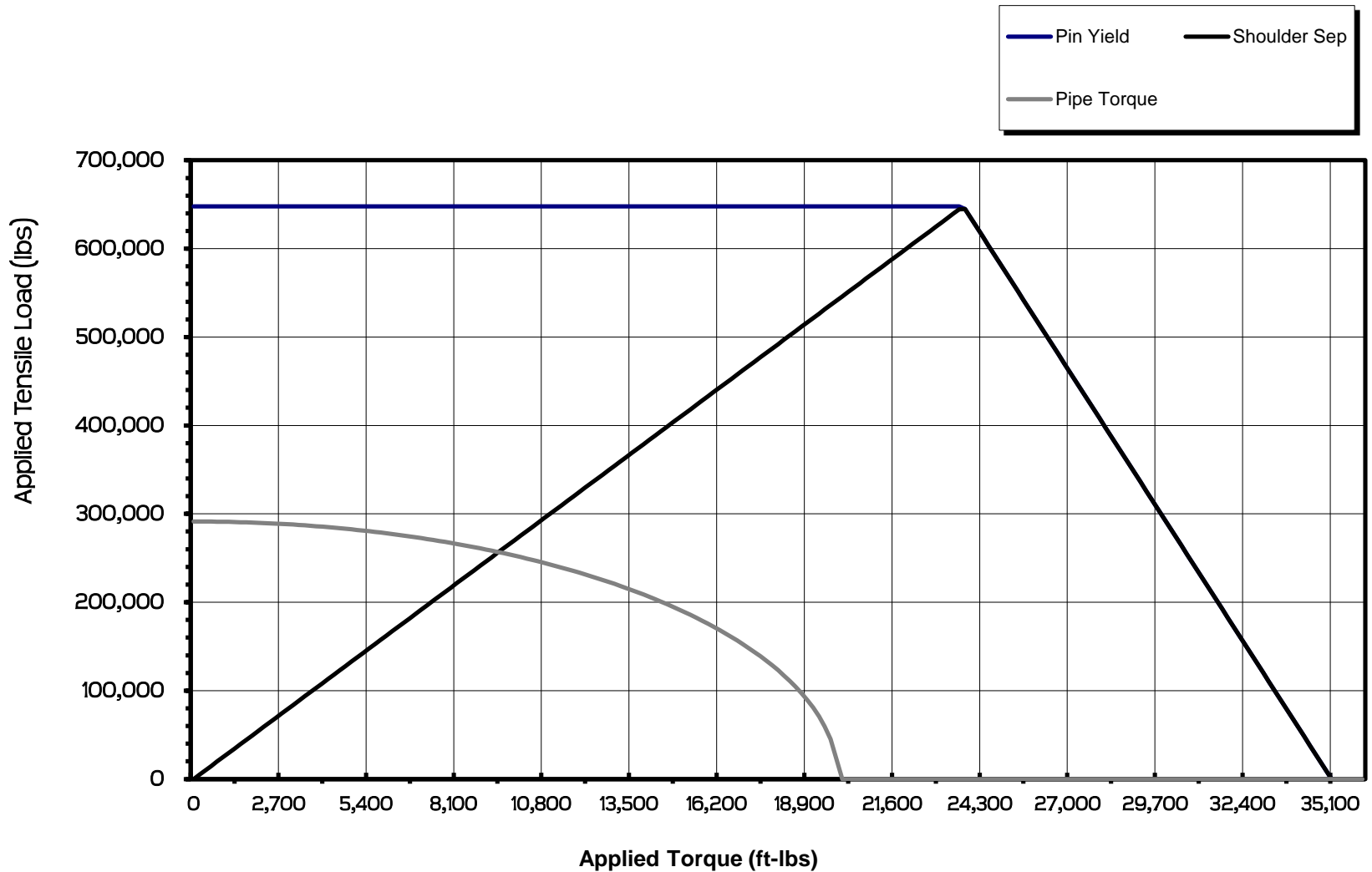
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Revision 1 - April 20, 2013

Pipe Body				
		<b>New-API</b>	<b>New-95%RBW</b>	<b>Premium</b>
OD (in)		4.000		3.738
Wall Thickness (in)		0.656		0.525
ID (in)		2.688		2.688
Calculated Plain End weights (lbs/ft)		23.417		17.999
<b>Note: Premium properties are calculated based on uniform OD and wall thickness.</b>				
Cross sectional area pipe body (in <sup>2</sup> )		6.892		5.297
Cross sectional area OD (in <sup>2</sup> )		12.566		10.972
Cross sectional area ID (in <sup>2</sup> )		5.675		5.675
Section Modulus (in <sup>3</sup> )		5.002		3.755
Polar Section Modulus (in <sup>3</sup> )		10.004		7.509
		<b>New-API</b>	<b>New-95%RBW</b>	<b>Premium</b>
Torsional Strength (ft-lbs)		26,500		19,900
Tensile Strength (lbs)		379,000		291,300
80% Torsional Strength (ft-lbs)		21,200		15,900
Pressure Capacity (psi)		15,785		14,432
Collapse Capacity (psi)		15,081		13,277
Tool Joint				
		<b>PTECH39+</b>		
		OD (in)	4 15/16	
		ID (in)	2 9/16	
<b>Tool Joint with a Material Yield Strength of 110000 psi</b>				
		Pin Tong length (in)	<b>24</b>	
		Box Tong length (in)	<b>24</b>	
		<b>Torsional Strength (ft-lbs)</b>	<b>34,540</b>	
		<b>Max Recommended Make-up Torque (ft-lbs)</b>	<b>20,700</b>	
		<b>Min Recommended Make-up Torque (ft-lbs)</b>	<b>16,300</b>	
		Balance OD (in)	4.955	
		<b>Tensile Strength (lbs)</b>	<b>653,800</b>	
		Tool joint/Drill pipe torsional ratio (New pipe)	1.30	
		Tool joint/Drill pipe torsional ratio (95% New pipe)		
		Tool joint/Drill pipe torsional ratio (Prem pipe)	1.74	
		Min OD for premium class (in)	4.281	
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)	26.80	* These calculations are based on new pipe with nominal wall		
95% Adjusted weight (lbs/ft)		Based on Bending Stress (psi) at Pipe OD	9,683	
Approximate length (ft)	31.20	Radius of Curvature ( R ) (ft.) (@ OD of pipe)	516.4	
95% Fluid Displacement (gal/ft)		BUR (dogleg) deg/100 ft.	11.1	
API Fluid Displacement (gal/ft)	0.410			
Fluid Capacity (gal/ft)	0.288			
Drift Size	2.438			

# TORQUE TENSION COMBINED LOAD CURVE

For PTECH39+ 4 15/16 X 2 9/16 Tool Joint with a Material Strength of 110000 psi, using a Coefficient of Friction factor of 0.08 and a Safety Factor of 1.0. On Pipe: 4 HWDP Premium Class.



PTECH39+ 4 15/16 X 2 9/16 TOOL JOINT OD WEAR CURVE

