

Pipe Size:	4.500 in	Grade:	S135	Range:	3
Pipe Weight:	16.60 lb/ft	Upset:	IEU	Connection:	450 DUO

Pipe

		NEW	API PREMIUM
Pipe size	<i>in</i> 4.500	OD <i>in</i> 4.500	4.365
Pipe weight	<i>lb/ft</i> 16.60	Thickness <i>in</i> 0.337	0.270
Upset Type	IEU	X-Sec Area <i>in²</i> 4.407	3.469
Tube grade	S135	Section Modulus <i>in³</i> 4.271	3.347
Range	3	Polar Section Modulus <i>in³</i> 8.543	6.694
Tube Yield	<i>ksi</i> 135	Tensile Yield <i>lbs</i> 595,000	468,000
ID	<i>in</i> 3.826	Torsional Yield <i>ft-lbs</i> 55,500	43,500
		80% Torsional Yield <i>ft-lbs</i> 44,400	34,800
		Internal Pressure Yield <i>psi</i> 17,700	16,200
		Collapse Yield <i>psi</i> 16,800	11,000
		D/t 13.35	16.19
		Connection/Tube Torsional Ratio 0.977	

Tool Joint

		NEW
Connection Type	450 DUO	OD <i>in</i> 5.500
Material Yield Strength	<i>ksi</i> 130	Tensile Yield Strength <i>lbs</i> 987,400
OD	<i>in</i> 5.500	Torsional Yield Strength <i>ft-lbs</i> 54,200
ID	<i>in</i> 3.000	Recommended Makeup Torque <i>ft-lbs</i> 32,500
Pin Shoulder Angle	<i>deg</i> 18	Maximum Makeup Torque <i>ft-lbs</i> 35,200
Pin Tool Joint Length	<i>in</i> 14.0	
Box Tool Joint Length	<i>in</i> 14.0	

Drill Pipe Assembly

Shoulder-Shoulder Length	<i>ft</i> 43.50	
Adjusted Weight	<i>lbs/ft</i> 17.81	
Closed End Displacement	<i>gal/ft</i> 0.850	<i>bbl/ft</i> 0.0202
Open End Displacement	<i>gal/ft</i> 0.272	<i>bbl/ft</i> 0.0065
Fluid Capacity	<i>gal/ft</i> 0.578	<i>bbl/ft</i> 0.0138
Drift Size	<i>in</i> 2.875	

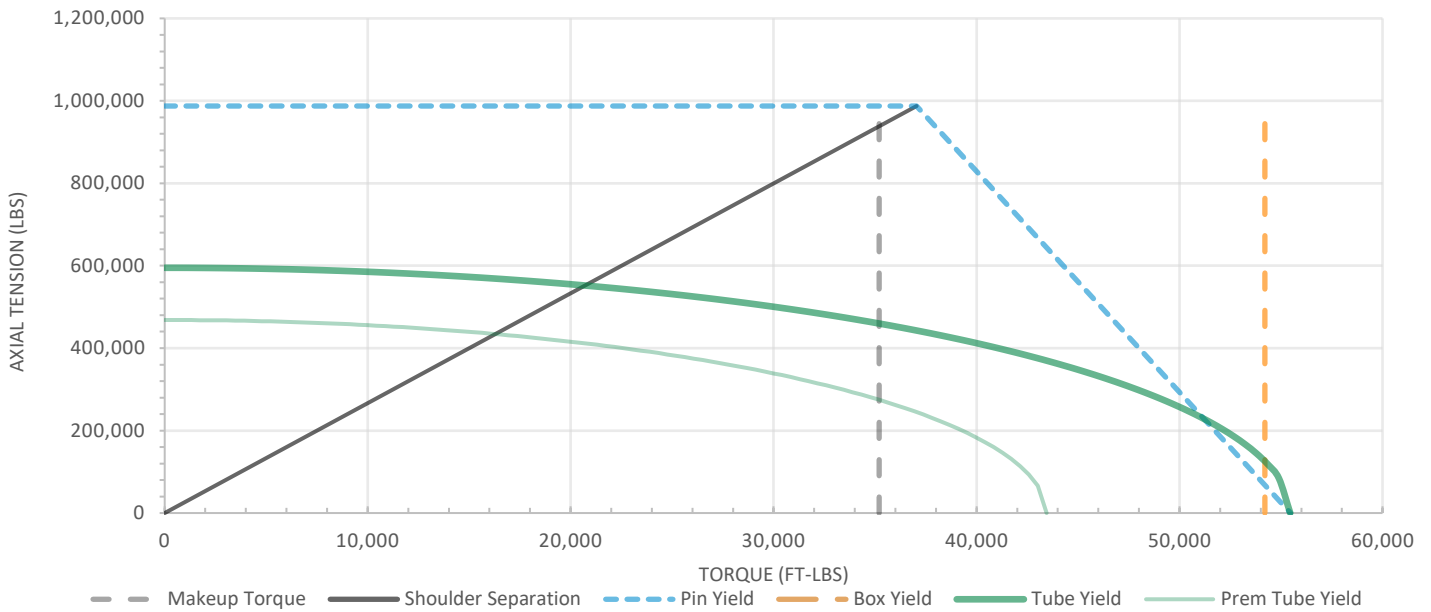
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Calculations are based on uniform wall thickness and outside diameter – no safety factor has been applied. The information provided for inspection classes is based on uniform wear and is not intended to recommend or confirm operational limits of any used product. It is recommended that drilling torque not exceed 80% of the makeup torque, however it is the responsibility of the end user to determine the acceptable use of the end product including appropriate performance ratings and safety factors where applicable. All connection torque calculations have been performed using a thread compound friction factor of 1.0. Complete Tubular Products does not endorse any specific thread compound and waives all responsibility in determining appropriate makeup torque values for any specific drilling circumstance. Modifying makeup torque values for any reason shall be done at the end users discretion and risk.

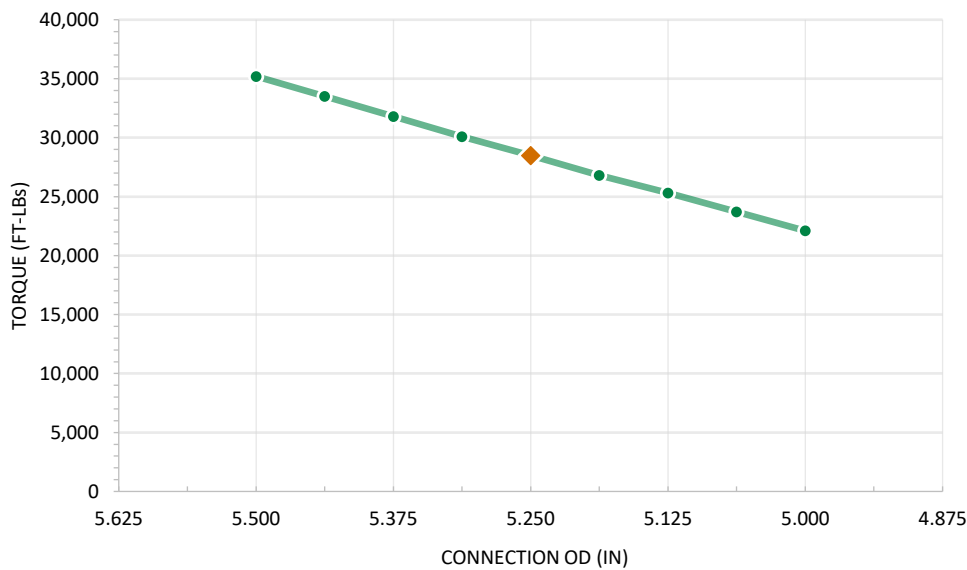
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Makeup Torque Then Tension Chart



Connection Wear Chart



CONNECTION OD (in)	MAXIMUM MAKEUP TORQUE (ft-lbs)
5.500	35,200
5.438	33,500
5.375	31,800
5.313	30,100
5.250	28,500
5.188	26,800
5.125	25,300
5.063	23,700
5.000	22,100
MIN REC OD (in)	28,500

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