

Pipe Size:	4.500 in	Grade:	S135	Range:	3
Pipe Weight:	20.00 lb/ft	Upset:	IEU	Connection:	400 DUO

### Pipe

		NEW	API PREMIUM
Pipe size	<i>in</i> 4.500	OD <i>in</i> <b>4.500</b>	4.328
Pipe weight	<i>lb/ft</i> 20.00	Thickness <i>in</i> <b>0.430</b>	0.344
Upset Type	IEU	X-Sec Area <i>in<sup>2</sup></i> <b>5.498</b>	4.306
Tube grade	S135	Section Modulus <i>in<sup>3</sup></i> <b>5.116</b>	3.977
Range	3	Polar Section Modulus <i>in<sup>3</sup></i> <b>10.232</b>	7.954
Tube Yield	<i>ksi</i> 135	Tensile Yield <i>lbs</i> <b>742,000</b>	581,000
ID	<i>in</i> 3.640	Torsional Yield <i>ft-lbs</i> <b>66,400</b>	51,600
		80% Torsional Yield <i>ft-lbs</i> <b>53,100</b>	41,280
		Internal Pressure Yield <i>psi</i> <b>22,600</b>	20,600
		Collapse Yield <i>psi</i> <b>23,300</b>	18,800
		D/t <b>10.47</b>	12.58
		Connection/Tube Torsional Ratio <b>0.732</b>	

### Tool Joint

		NEW
Connection Type	400 DUO	OD <i>in</i> <b>5.250</b>
Material Yield Strength	<i>ksi</i> 130	Tensile Yield Strength <i>lbs</i> <b>918,900</b>
OD	<i>in</i> 5.250	Torsional Yield Strength <i>ft-lbs</i> <b>48,600</b>
ID	<i>in</i> 2.688	Recommended Makeup Torque <i>ft-lbs</i> <b>29,200</b>
Pin Shoulder Angle	<i>deg</i> 18	Maximum Makeup Torque <i>ft-lbs</i> <b>31,600</b>
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> <b>43.50</b>	
Adjusted Weight	<i>lbs/ft</i> <b>21.16</b>	
Closed End Displacement	<i>gal/ft</i> <b>0.844</b>	<i>bbl/ft</i> 0.0201
Open End Displacement	<i>gal/ft</i> <b>0.323</b>	<i>bbl/ft</i> 0.0077
Fluid Capacity	<i>gal/ft</i> <b>0.521</b>	<i>bbl/ft</i> 0.0124
Drift Size	<i>in</i> <b>2.563</b>	

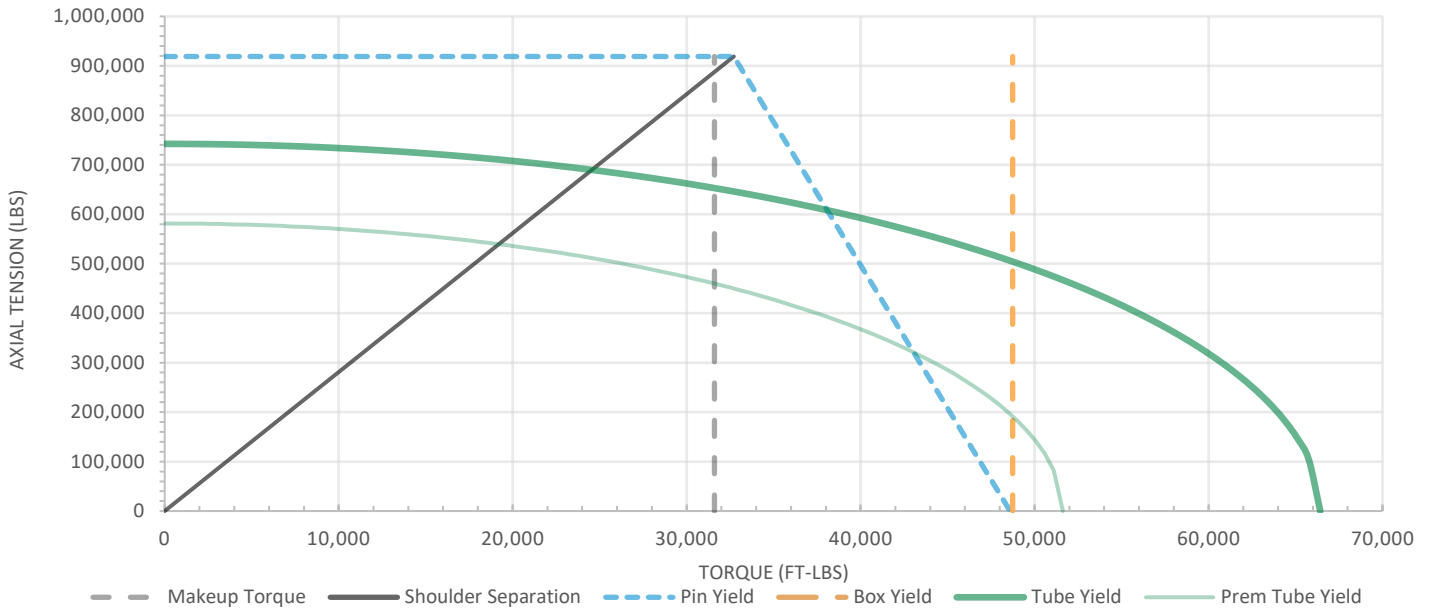
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Calculations are based on uniform wall thickness and outside diameter – no safety factor has been applied. The information provided for inspection classes is based on uniform wear and is not intended to recommend or confirm operational limits of any 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.

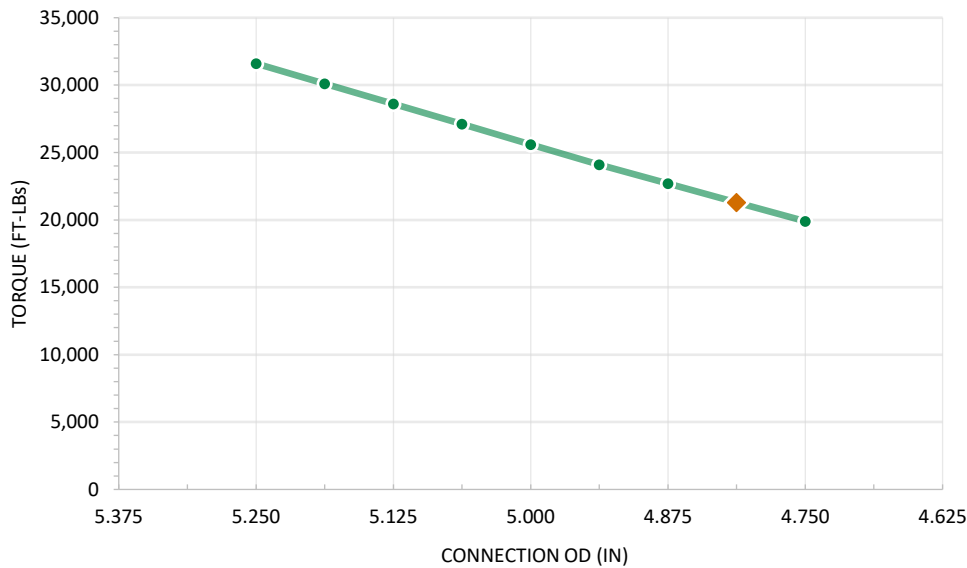
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### Makeup Torque Then Tension Chart



### Connection Wear Chart



CONNECTION OD (in)	MAXIMUM MAKEUP TORQUE (ft-lbs)
5.250	31,600
5.188	30,100
5.125	28,600
5.063	27,100
5.000	25,600
4.938	24,100
4.875	22,700
4.813	21,300
4.750	19,900
<b>MIN REC OD (in)</b>	
4.813	21,300

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