

Pipe						METRIC		
						NEW	API PREMIUM	
Pipe size	<i>in</i>	4.500	<i>mm</i>	114.3	OD	<i>mm</i>	114.3	110.9
Pipe weight	<i>lb/ft</i>	16.60	<i>kg/m</i>	24.70	Thickness	<i>mm</i>	8.6	6.8
Upset Type		IEU			X-Sec Area	<i>cm²</i>	28.4	22.4
Tube grade		S135			Section Modulus	<i>cm³</i>	70.0	54.8
Range		3			Polar Section Modulus	<i>cm³</i>	140.0	109.7
Tube Yield	<i>MPa</i>	931			Tensile Yield	<i>kdaN</i>	265	208
ID	<i>mm</i>	97.2			Torsional Yield	<i>N-m</i>	75,200	59,000
					80% Torsional Yield	<i>N-m</i>	60,200	47,200
					Internal Pressure Yield	<i>MPa</i>	122.0	111.7
					Collapse Yield	<i>MPa</i>	115.8	75.8
					D/t		13.35	16.19
					Connection/Tube Torsional Ratio		0.977	

Tool Joint						METRIC	
						NEW	
Connection Type		450 DUO			OD	<i>mm</i>	139.7
Material Yield Strength	<i>MPa</i>	896			Tensile Yield Strength	<i>kdaN</i>	439
OD	<i>mm</i>	139.7			Torsional Yield Strength	<i>N-m</i>	73,500
ID	<i>mm</i>	76.2			Recommended Makeup Torque	<i>N-m</i>	44,100
Pin Shoulder Angle	<i>deg</i>	18			Maximum Makeup Torque	<i>N-m</i>	47,700
Pin Tool Joint Length	<i>mm</i>	356					
Box Tool Joint Length	<i>mm</i>	356					

Drill Pipe Assembly						METRIC	
					Shoulder-Shoulder Length	<i>m</i>	13.26
					Adjusted Weight	<i>kg/m</i>	26.50
					Closed End Displacement	<i>L/m</i>	10.56
					Open End Displacement	<i>L/m</i>	3.38
					Fluid Capacity	<i>L/m</i>	7.18
					Drift Size	<i>mm</i>	73.0

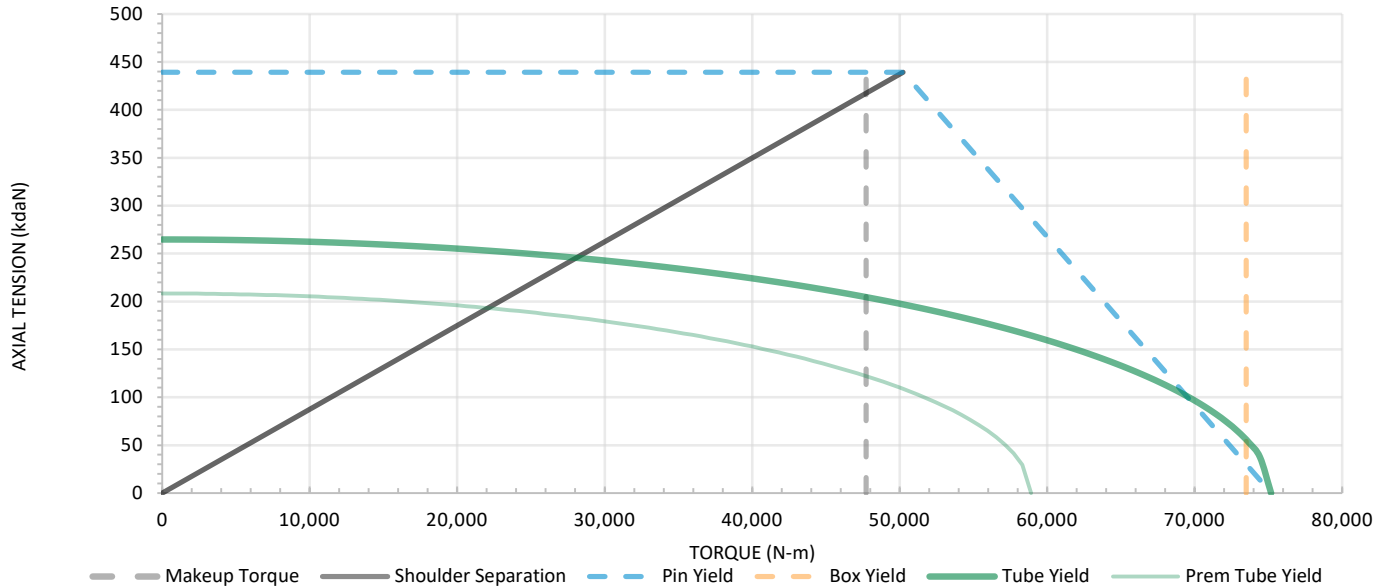
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Calculations are based on uniform wall thickness and outside diameter – no safety factor has been applied. The information provided for inspection classes is based on uniform wear and is not intended to recommend or confirm operational limits of any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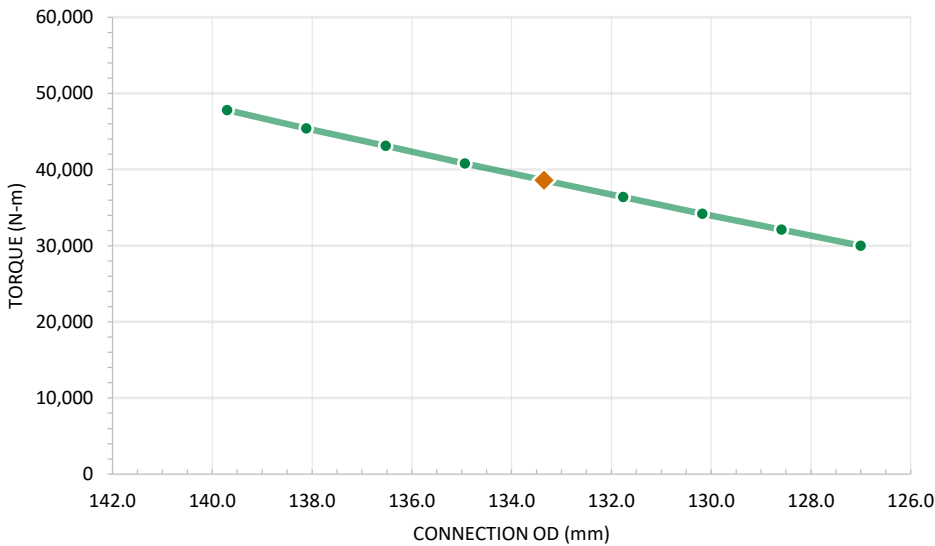
Makeup Torque Then Tension Chart

METRIC



Connection Wear Chart

METRIC



CONNECTION OD (mm)	MAXIMUM MAKEUP TORQUE (N-m)
139.7	47,800
138.1	45,400
136.5	43,100
134.9	40,800
133.4	38,600
131.8	36,400
130.2	34,200
128.6	32,100
127.0	30,000
MIN REC OD (mm)	38,600
133.4	38,600

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