

Drill Pipe Performance Sheet

Size and Weight: 4.500" 16.60 ppf 0.337" wall IEU*

Grade: S-135

Range: 2

Tool Joint: 5.250" x 3.000" *Delta425*

Pipe Body:

	Nominal 100% RBW	95% RBW	Ultra Class 90% RBW	Premium 80% RBW
OD (in):	4.500	4.466	4.433	4.365
Wall Thickness (in):	0.337	0.320	0.303	0.270
Nominal ID (in):	3.826	3.826	3.826	3.826
Tensile Strength (lbs):	595,004	562,966	531,168	468,296
Torsional Strength (ft-lbs):	55,453	52,405	49,389	43,450
Burst Capacity (psi):	17,693	19,209	18,198	16,176
Collapse Capacity (psi):	16,773	15,354	13,913	10,964

Notes: Body properties are calculated based on uniform OD and wall thickness.
 Burst capacity for Nominal (100% RBW) based on 87.5% RBW per API.

Tubular Assembly:

Adjusted Weight (lbs/ft):	18.94	Fluid Displacement (gal/ft):	0.29
Approximate Length (ft):	31.5	Fluid Displacement (bbls/ft):	0.0069
Box TJ Length (in):	15	Fluid Capacity w/IPC (gal/ft):	0.56
Pin TJ Length (in):	12	Fluid Capacity w/IPC (bbls/ft):	0.0133
Upset Type:	IEU*	Fluid Capacity w/o IPC (gal/ft):	Not Reported
Max Upset OD (in):	4.600	Fluid Capacity w/o IPC (bbls/ft):	Not Reported
Drift Size (in):	2.875		

Note: These are OEM values that may vary with actual values due to mill tolerances, IPC tolerances, OEM rounding, and other factors. Pipe is purchased at a guaranteed 95% RBW. IPC is applied to a nominal thickness of 0.009".

Connection: *Delta425*

	1.0 FF	1.1 FF	1.15 FF
TJ OD (in): 5.250	Extended MUT (ft-lbs): 30,435	33,479	35,000
TJ ID (in): 3.000	Tension at Shoulder Separation @ Ext MUT (lbs): Tensile Limited	Tensile Limited	Tensile Limited
MYS (ksi): 130	Tension at Connection Yield @ Ext MUT (lbs): 471,700	471,700	471,700
Maximum MUT is recommended based on thread compound friction factor (unless stated). Lower than maximum MUT should only be used when MUT is limited by rig equipment or connection tensile. Lower than minimum MUT should never be used.	Maximum MUT (ft-lbs): 26,000	28,600	29,900
	Tension at Shoulder Separation @ Max MUT (lbs): Tensile Limited	Tensile Limited	Tensile Limited
	Tension at Connection Yield @ Max MUT (lbs): 628,943	628,943	628,943
	Minimum MUT (ft-lbs): 21,600	23,760	24,840
	Tension at Shoulder Separation @ Min MUT (lbs): Tensile Limited	Tensile Limited	Tensile Limited
	Tension at Connection Yield @ Min MUT (lbs): 786,179	786,179	786,179
	Tool Joint Torsional Strength (ft-lbs): 43,300	47,630	49,795
	Tool Joint Tensile Strength (lbs): 786,179	786,179	786,179

Delta425 is a trademark of NOV Grant Prideco.

Note: There is no published pressure rating for this connection.

***ADJUST makeup torque according to thread compound friction factor (FF) greater than 1.0 up to 1.15 FF. Not to exceed 1.15 regardless of dope FF.* Reference Page 3**

Elevator Shoulder:

Smooth Edge Height (in):	3/32
Smooth Edge OD (in):	5.438
SE Elevator Shoulder Capacity (lbs):	579,800
Nominal TJ OD (in):	5.250
Nominal TJ OD Elevator Shoulder Capacity (lbs):	406,800
Assumed Elevator Bore (in):	4.781

Note: Elevator capacity based on assumed elevator bore, no wear factor, and contact stress of 110, 100 psi. An increased elevator shoulder OD increases elevator capacity without affecting make-up torque.

Drill Pipe Performance Sheet

10/16/2018

Combined Loading for Drill Pipe

Connection: Delta™ 425 5.25" x 3.0" (130 KSI SMYS) Friction Factor: 1.15

Pipe: 4.5" OD 0.337" Wall Thickness S135 80% Inspection Class

At Max MUT (350000 ft-lbs)	
Operational Torque(ft-lbs)	Assembly Max Tension(lbs)
0	468300
1700	467900
3400	466900
5000	465200
6700	462700
8400	459500
10100	455500
11700	451000
13400	445500
15100	439100
16800	431900
18500	423700
20100	415200
21800	405100
23500	393900
25200	381500
26800	368600
28500	353500
30200	336700
31900	318000

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Connection Wear Table

Connection: Delta™ 425 5.25" x 3.0" (130 KSI SMYS) Friction Factor: 1.15

Tool Joint OD (in)	Max MUT(ft-lbs)
5.25	34800
5.219	34800
5.189	34000
5.158	33100
5.128	32200
5.097	31200
5.067	30300
5.036	29400
5.006	28500
4.975	27500
4.945	26700
4.914	25800

Elevator Capacity

Elevator Bore Diameter: 4.78175" Elevator SMYS: 110,100 psi Box Taper Angle: 18 deg

Connection: Delta™ 425 4.5" 0.337" wall IEU S135

Tool Joint OD (in.)	Elevator Hoist Capacity (lbs)	
	No Wear	1/32" Wear Factor
5.25	406200	380300
5.219	378100	352200
5.189	351100	325200
5.158	323400	297500
5.128	296700	270800
5.097	269300	243400
5.067	242900	217000
5.036	215800	189900
5.006	189800	163900
4.975	163000	137100
4.945	137300	111400
4.914	110900	85000

All references to any internal standards or specifications are per the current edition/revision at the point of manufacturing, unless otherwise stated. All references to any external standards or specifications are per the current edition/revision at the original purchase order (P.O.) date, unless otherwise stated.



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Makeup Torque Guidelines

- Good **COPPER-BASED** thread compound is recommended for rotary-shouldered drill pipe connections by the OEM.
- Be **LIBERAL** with the thread compound in the box, the base of the box, and on the pin using a copper-based or a compatible thread compound.
- Ensure **360 DEGREES** of coverage of the threads and torque shoulders.
- Ensure **360 DEGREES** of coverage on the seal surfaces on completion pipe.
- Always **ENSURE** proper pipe alignment.
- **ADJUST** makeup torque according to thread compound friction factor (FF) greater than 1.0 FF up to 1.15 FF.

Workstrings Engineering is available for more information.

- **MINIMIZE** clamp pressure with the tongs or iron roughneck.
- **MAXIMIZE** the distance between the box shoulder and lower jaw die per OEM guidelines (1"-2" minimum for most tool joints).
- Use a **SLOW** rotation speed during spin-up and break-out of the first 5-6 threads - especially critical for premium and completion connections.

NOTE: More detailed running procedures for proprietary rotary-shouldered connections are available from the OEM's website (NOV Grant Prideco and Tenaris), Workstrings Engineering or Workstrings' website.

For all of our current specification sheets, please visit workstringsinternational.com/equipment/spec-sheets/

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