Section 2 - Drillpipe
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API Drillpipe Requirements Drift Test

Drillpipe Size	Drift Mandrel Length	Drift Mandrel Diameter
All EU (Except 3.5", 13.3#)	4"	ID Minus 3/16"

Tensile Requirements

Grade	Yield Strength		Tensile Strength
	Min	Max	Min
	psi	psi	psi
D*	55,000	-	95,000
E	75,000	105,000	100,000
X-95	95,000	125,000	105,000
G-105	105,000	135,000	115,000
S-135	135,000	165,000	145,000

* Grade “D” is no longer listed in API

Range Lengths

	Range 1	Range 2	Range 3
	ft	ft	ft
Total range length, includes	18-22	27-30	38-45
Range length for 95% or more of carload:			
Permissible length, minimum	20	-	-
Permissible variation, maximum	2	-	-
Range length for 90% or more of carload:			
Permissible length, minimum	-	27	38
Permissible variation, maximum	-	2	3

Tolerances

Drillpipe Size	Dimension	Tolerance
in.		in.
2.375 - 3.500	OD■	+ 3/32, - 1/32
4.000 - 5.000	OD■	+ 7/64, - 0.75% OD
5.500 - 6.625	OD■	+ 1/8, - 0.75% OD
All Sizes	Wall Thickness	- 12.5%
	ID	Governed by OD Tolerances
	Eccentricity OD	.093 Max (Total indicator reading)
	Eccentricity ID	1/16 Max (1/8" Total indicator reading)
	Ovality (On upset)	.093 Maximum

■ Measurements made immediately behind the upset for a distance of approximately 5" for sizes 5.5" OD and smaller, and a distance approximately equal to the OD for sizes larger than 5.5"

Data provided by API from table 9 API Spec 5D; October, 2001

Mechanical Properties of New Tool Joints and New Grade E Drillpipe

Drillpipe Data					Tool Joint Data							Drillpipe Data	
OD	Weight (lb/ft)		Upset		Connection				Strength		Rec Make-Up Torque	Strength	
	Nom Wt	Approx Wt*	Type	OD	Type	OD	ID	Drift ID	Tensile Yield■	Torsion Yield◆		Tensile Yield	Torsion Yield▲
in.	lb/ft			in.		in.	in.	in.	lb	ft-lb	ft-lb	lb	ft-lb
2-3/8	4.85	5.26	EU	2.656	NC26(IF)	3-3/8	1-3/4	1.625	313,681	6,875b	4,125b	97,817	4,763
		4.95			OH	3-1/8	2	1.807	206,416	4,521p	2,713p		
		5.05			SLH90	3-1/4		1.850	202,670	5,129p	3,074p		
		5.15			WO	3-3/8		1.807	205,369	4,311p	2,586p		
2-3/8	6.65	6.99	EU	2.656	NC26(IF)	3-3/8	1-3/4	1.625	313,681	6,875b	4,125b	138,214	6,250
		6.89			OH	3-1/4			294,620	6,484b	3,891b		
		6.71	IU	2.500	PAC	2-7/8	1-3/8	1.250	238,504	4,688p	2,813p		
		6.78	EU	2.656	SLH90	3-1/4	2	1.670	202,850	5,129p	3,074p		
2-7/8	6.85	7.50	EU	3.219	NC31(IF)	4-1/8	2-1/8	2.000	447,130	12,053p	7,122p	135,902	8,083
		6.93			OH	3-3/4	2-7/16	2.253	223,937	5,585p	3,351p		
		7.05			SLH90	3-7/8		2.296	260,783	7,628p	4,575p		
		7.31			WO	4-1/8		2.253	289,264	7,197p	4,318p		
2-7/8	10.40	10.87	EU	3.219	NC31(IF)	4-1/8	2-1/8	1.963	447,130	12,053p	7,122p	214,344	11,554
		10.59			OH	3-7/8	2-5/32		345,566	8,814p	5,270p		
		10.27	IU	2.875	PAC	3-1/8	1-1/2	1.375	272,938	5,730p	3,439p		
		10.59	EU	3.219	SLH90	3-7/8	2-5/32	2.006	382,765	11,288p	6,773p		
		11.19	IU	2.875	XH	4-1/4	1-7/8	1.750	505,054	13,282p	7,969p		
		10.35			NC26(SH)	3-3/8	1-3/4	1.625	313,681	6,875b	4,125b		
3-1/2	9.50	10.58	EU	3.938	NC38(IF)	4-3/4	2-11/16	2.563	587,308	18,107p	10,864p	194,264	14,146
		9.84			OH	4-1/2	3	2.804	392,071	11,870p	7,218p		
		9.99			SLH90	4-5/8		2.847	366,705	12,650p	7,584p		
		10.14			WO	4-3/4		2.804	419,797	12,878p	7,688p		
3-1/2	13.30	14.37	EU	3.938	H90	5-1/4	2-3/4	2.619	664,050	23,847p	14,300p	271,569	18,551
		13.93			NC38(IF)	4-3/4	2-11/16	2.457	587,308	18,107p	10,864p		
		13.75			OH			2.414	559,582	17,305p	10,387p		
		13.40	IU	3.500	NC31(SH)	4-1/8	2-1/8	2.000	447,130	11,869p	7,122p		
		13.91	EU	3.938	XH	4-3/4	2-7/16	2.313	570,939	17,493p	10,496p		
3-1/2	15.50	16.54	EU	3.938	NC38(IF)	5	2-9/16	2.414	649,158	20,326p	12,196p	322,775	21,086
4	11.85	13.00	IU	4.250	H90	5-1/2	2-13/16	2.688	913,708	35,374p	21,224p	230,755	19,474
		13.52	EU	4.563	NC46(IF)	6	3-1/4	3.125	901,164	33,625p	20,175p		
		12.10			OH	5-1/4	3-15/32	3.287	621,357	21,976p	13,186p		
		12.91			WO	5-3/4	3-7/16	3.313	782,987	28,809p	17,285p		
4	14.00	15.04	IU	4.250	NC40(FH)	5-1/4	2-13/16	2.688	711,611	23,487p	14,092p	285,359	23,288
		15.43			H90	5-1/2			913,708	35,374p	21,224p		
		15.85	EU	4.563	NC46(IF)	6	3-1/4	3.125	901,164	33,625p	20,175p		
		15.02			OH	5-1/2			759,875	27,289p	16,320p		
		14.35	IU	4.250	SH	4-5/8	2-9/16	2.438	512,035	15,170p	9,102p		
4	15.70	16.80	IU	4.250	NC40(FH)	5-1/4	2-11/16	2.563	776,406	25,673p	15,404p	324,118	25,810
		17.09			H90	5-1/2	2-13/16	2.688	913,708	35,374p	21,224p		
		17.54	EU	4.563	NC46(IF)	6	3-1/4	3.095	901,164	33,625p	20,175p		
4-1/2	13.75	15.23	IU	4.750	H90	6	3-1/4	3.125	938,403	38,925p	23,355p	270,034	25,907
		15.36	EU	5.063	NC50(IF)	6-3/8	3-3/4	3.625	939,096	37,676p	22,605p		
		14.04			OH	5-3/4	3-31/32	3.770	554,844	20,939p	12,563p		
		14.77			WO	6-1/8	3-7/8	3.750	849,266	33,651p	20,190p		

* Tool Joint plus drillpipe

■ The tensile strength of the tool joint pin is based on 120,000 PSI yield and the cross sectional area at the root of the thread 5/8 inch from the shoulder

▲ Torsional yield strength based on shear strength of 57.7 percent of the minimum yield strength

◆ p = pin limited yield; b = box limited yield; P or B indicates that tool joint could not meet 80 percent of tube torsion yield

Multiply ft-lb by 1.36 to convert to *Nm*

Data provided by API from Tables 8 and 10 from Figures 1-25, 16th edition, API 7G; August, 1998

Mechanical Properties of New Tool Joints and New Grade E Drillpipe (Continued)

Drillpipe Data					Tool Joint Data							Drillpipe Data	
OD	Weight (lb/ft)		Upset		Connection				Strength		Rec Make-Up Torque	Strength	
	Nom Wt	Approx Wt*	Type	OD	Type	OD	ID	Drift ID	Tensile Yield■	Torsion Yield◆		Tensile Yield	Torsion Yield▲
in.	lb/ft			in.		in.	in.	in.	lb	ft-lb	ft-lb	lb	ft-lb
4-1/2	16.60	18.14	IEU	4.750	FH	6	3	2.875	976,156	34,780p	20,868p	330,558	30,807
		17.92			H90		3-1/4	3.125	938,403	38,925p	23,355p		
		17.95	EU	5.063	NC50(IF)	6-5/8	3-3/4	3.625	939,096	37,676p	22,836p		
		17.07			OH	5-7/8			713,979	27,243p	16,346p		
		16.79	IEU	4.750	NC38(SH)	5	2-11/16	2.563	587,308	18,346p	11,008p		
		18.37			NC46(XH)	6-1/4	3-1/4	3.125	901,164	33,993p	20,396p		
4-1/2	20.00	21.64	IEU	4.781	FH	6	3	2.875	976,156	34,780p	20,868p	412,358	36,901
					H90				1,085,665	45,152p	27,091p		
		21.59	EU	5.063	NC50(IF)	6-5/8	3-5/8	3.452	1,025,980	41,235p	24,993p		
		22.09	IEU	4.781	NC46(XH)	6-1/4	3	2.875	1,048,426	39,659p	23,795p		
4-1/2	22.82	24.11	EU	5.063	NC50(IF)	6-5/8	3-5/8	3.452	1,025,980	41,235p	24,741p	471,239	40,912
		24.56	IEU	4.781	NC46(XH)	6-1/4	3	2.875	1,048,426	39,659p	23,795p		
5	19.50	22.28	IEU	5.188	5-1/2 FH	7	3-3/4	3.625	1,448,407	60,338b	36,203b	395,595	41,167
		20.85			NC50(XH)	6-5/8			939,095	37,676p	22,836p		
5	25.60	28.27	IEU	5.188	5-1/2 FH	7	3-1/2	3.375	1,619,231	60,338b	37,742b	530,144	52,257
		26.85			NC50(XH)	6-5/8			1,109,920	44,673p	27,076p		
5-1/2	21.90	23.78	IEU	5.188	FH	7	4	3.875	1,265,802	56,045p	33,560p	437,116	50,710
5-1/2	24.70	26.30	IEU	5.188	FH	7	4	3.875	1,265,802	56,045p	33,560p	497,222	56,574
6-5/8	25.20	27.28	IEU	5.188	FH	8	5	4.875	1,447,697	73,620p	44,196p	489,464	70,580
6-5/8	27.70	29.06	IEU	5.188	FH	8	5	4.875	1,447,697	73,620p	44,196p	534,198	76,295

* Tool Joint plus drillpipe

■ The tensile strength of the tool joint pin is based on 120,000 PSI yield and the cross sectional area at the root of the thread 5/8 inch from the shoulder

▲ Torsional yield strength based on shear strength of 57.7 percent of the minimum yield strength

◆ p = pin limited yield; b = box limited yield; P or B indicates that tool joint could not meet 80 percent of tube torsion yield

Multiply ft-lb by 1.36 to convert to *Nm*

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