

Drill Pipes

Drill pipes are manufactured from upset pipe body and friction-welded tool joints. Tool joints are forged from chromium molybdenum alloy steel, and uniformly quenched and tempered to obtain API Spec.7-1 properties.

Pipe body standard grades, covered by API Spec. 5DP/ISO 11961 are:

- Grade E
- High-strength grades X, G and S

The type of upsets are: EU, IU, IEU

Tool joints are joined to the pipe body by friction welding.

Each weld is 100% inspected according to API Spec. 5DP.

Drill pipes are also provided with internal coating and customer selected hardbanding.

Mechanical Properties on Tool Joint

Yield Strength psi		Tensile Strength psi	Elongation %	Charpy V Impact ft-lb	Brinell Hardness
min.	max.	min.	min.	min. (+ 70°F)	Min.
120 000	165 000	140 000	13	40 average	285 HB

Mechanical Properties on Pipe Body

Grade	Yield Strength psi		Tensile Strength psi	Elongation %	Charpy V Impact ft-lb
	min.	max.	min.	min.	min. (+ 70°F)
Grade E	75 000	105 000	100 000	a	40 average
Grade X	95 000	125 000	105 000	a	40 average
Grade G	105 000	135 000	115 000	a	40 average
Grade S	135 000	165 000	145 000	a	40 average

a: The minimum elongation is calculated with the formula:

$$e = 625000A^{0.2}/U^{0.9}$$

A: cross section area of tensile strength (sq.in.)

U: specified tensile strength (psi)



Designations ^a					Pipe body OD	Pipe wall thickness	Drill pipe weld neck	Tool joint				RSC bevel dia.	Approx. mass ^c
								OD	Pin ID	Pin OD length	Box OD length		
Nominal OD	Nominal Weight lb/ft	Grade	Upset type	RSC type ^d	D_{dp} in	t in -12.5%	D_{te} in max.	D in ± 0.031	d_p in +0.016 -0.031	L_{pb} in ±0.250	L_b in ±0.250	D_f in ±0.016	W_{dp} lb/ft Calculated
1	2	3	4	5	6	7	8	9	10	11	12	13	14
Internal upset, IU													
4	14.00	E	IU	NC40	4.000	0.330	4.188	5.250	2.812	7.000	10.000	5.016	15.06
4	14.00	X	IU	NC40	4.000	0.330	4.188	5.250	2.688	7.000	10.000	5.016	15.29
4	14.00	G	IU	NC40	4.000	0.330	4.188	5.500	2.438	7.000	10.000	5.016	15.87
4	14.00	S	IU	NC40	4.000	0.330	4.188	5.500	2.000	7.000	10.000	5.016	16.14
4-1/2	13.75	E	IU	NC46	4.500	0.271	4.688	6.000	3.375	7.000	10.000	5.719	15.12
External upset, EU													
2-3/8	6.65	E	EU	NC26	2.375	0.280	2.563	3.375	1.750	7.000	8.000	3.266	7.02
2-3/8	6.65	X,G	EU	NC26	2.375	0.280	2.563	3.375	1.750	7.000	8.000	3.266	7.11
2-7/8	10.40	E	EU	NC31	2.875	0.362	3.188	4.125	2.125	7.000	9.000	3.953	10.92
2-7/8	10.40	X,G	EU	NC31	2.875	0.362	3.188	4.125	2.000	7.000	9.000	3.953	11.09
2-7/8	10.40	S	EU	NC31	2.875	0.362	3.188	4.375	1.625	7.000	9.000	3.953	11.55
3-1/2	9.50	E	EU	NC38	3.500	0.254	3.875	4.750	2.688	8.000	10.500	4.578	10.60
3-1/2	13.30	E	EU	NC38	3.500	0.368	3.875	4.750	2.688	8.000	10.500	4.578	13.96
3-1/2	13.30	X	EU	NC38	3.500	0.368	3.875	5.000	2.562	8.000	10.500	4.578	14.62
3-1/2	13.30	G	EU	NC38	3.500	0.368	3.875	5.000	2.438	8.000	10.500	4.578	14.72
3-1/2	13.30	S	EU	NC38	3.500	0.368	3.875	5.000	2.125	8.000	10.500	4.578	14.93
3-1/2	15.50	E	EU	NC38	3.500	0.449	3.875	5.000	2.563	8.000	10.500	4.578	16.58
3-1/2	15.50	X	EU	NC38	3.500	0.449	3.875	5.000	2.438	8.000	10.500	4.578	16.84
3-1/2	15.50	G	EU	NC38	3.500	0.449	3.875	5.000	2.125	8.000	10.500	4.578	17.06
3-1/2	15.50	S	EU	NC40	3.500	0.449	3.875	5.550	2.250	7.000	10.000	5.016	17.60
4	14.00	E	EU	NC46	4.000	0.330	4.500	6.000	3.250	7.000	10.000	5.719	15.91
4	14.00	X,G	EU	NC46	4.000	0.330	4.500	6.000	3.250	7.000	10.000	5.719	16.21
4	14.00	S	EU	NC46	4.000	0.330	4.500	6.000	3.000	7.000	10.000	5.719	16.44
4-1/2	13.75	E	EU	NC50	4.500	0.271	5.000	6.625	3.750	7.000	10.000	6.063	15.90
4-1/2	16.60	E	EU	NC50	4.500	0.337	5.000	6.625	3.750	7.000	10.000	6.063	18.49
4-1/2	16.60	X,G	EU	NC50	4.500	0.337	5.000	6.625	3.750	7.000	10.000	6.063	18.86
4-1/2	16.60	S	EU	NC50	4.500	0.337	5.000	6.625	3.500	7.000	10.000	6.063	19.13
4-1/2	20.00	E	EU	NC50	4.500	0.430	5.000	6.625	3.625	7.000	10.000	6.063	22.13
4-1/2	20.00	X,G	EU	NC50	4.500	0.430	5.000	6.625	3.500	7.000	10.000	6.063	22.60
4-1/2	20.00	S	EU	NC50	4.500	0.430	5.000	6.625	3.000	7.000	10.000	6.063	23.07

Designations ^a					Pipe body OD	Pipe wall thickness	Drill pipe weld neck	Tool joint				RSC bevel dia.	Approx. mass ^c
								OD	Pin ID	Pin OD length	Box OD length		
Nominal OD	Nominal Weight lb/ft	Grade	Upset type	RSC type ^d	D_{dp} in	t in -12.5%	D_{te}^b in max.	D in ±0.031	d_p in +0.016 -0.031	L_{pb} in ±0.250	L_b in ±0.250	D_f in ±0.016	W_{dp} lb/ft Calculated
1	2	3	4	5	6	7	8	9	10	11	12	13	14
Internal-external upset, IEU													
4-1/2	16.60	E	IEU	NC46	4.500	0.337	4.688	6.250	3.250	7.000	10.000	5.719	18.39
4-1/2	16.60	X,G	IEU	NC46	4.500	0.337	4.688	6.250	3.000	7.000	10.000	5.719	18.63
4-1/2	16.60	S	IEU	NC46	4.500	0.337	4.688	6.250	2.750	7.000	10.000	5.719	18.84
4-1/2	20.00	E	IEU	NC46	4.500	0.430	4.688	6.250	3.000	7.000	10.000	5.719	22.14
4-1/2	20.00	X	IEU	NC46	4.500	0.430	4.688	6.250	2.750	7.000	10.000	5.719	22.64
4-1/2	20.00	G	IEU	NC46	4.500	0.430	4.688	6.250	2.500	7.000	10.000	5.719	22.83
4-1/2	20.00	S	IEU	NC46	4.500	0.430	4.688	6.250	2.250	7.000	10.000	5.719	23.00
5	19.50	E	IEU	NC50	5.000	0.362	5.125	6.625	3.750	7.000	10.000	6.063	21.37
5	19.50	X	IEU	NC50	5.000	0.362	5.125	6.625	3.500	7.000	10.000	6.063	21.89
5	19.50	G	IEU	NC50	5.000	0.362	5.125	6.625	3.250	7.000	10.000	6.063	22.14
5	19.50	S	IEU	NC50	5.000	0.362	5.125	6.625	2.750	7.000	10.000	6.063	22.58
5	19.50	E	IEU	5 1/2 FH	5.000	0.362	5.125	7.000	3.750	8.000	10.000	6.719	22.32
5	19.50	X,G	IEU	5 1/2 FH	5.000	0.362	5.125	7.000	3.750	8.000	10.000	6.719	22.58
5	19.50	S	IEU	5 1/2 FH	5.000	0.362	5.125	7.250	3.500	8.000	10.000	6.719	23.44
5	25.60	E	IEU	NC50	5.000	0.500	5.125	6.625	3.500	7.000	10.000	6.063	27.37
5	25.60	X	IEU	NC50	5.000	0.500	5.125	6.625	3.000	7.000	10.000	6.063	28.09
5	25.60	G	IEU	NC50	5.000	0.500	5.125	6.625	2.750	7.000	10.000	6.063	28.30
5	25.60	E	IEU	5 1/2 FH	5.000	0.500	5.125	7.000	3.500	8.000	10.000	6.719	28.32
5	25.60	X	IEU	5 1/2 FH	5.000	0.500	5.125	7.000	3.500	8.000	10.000	6.719	28.56
5	25.60	G	IEU	5 1/2 FH	5.000	0.500	5.125	7.250	3.500	8.000	10.000	6.719	29.1
5	25.60	S	IEU	5 1/2 FH	5.000	0.500	5.125	7.250	3.250	8.000	10.000	6.719	29.40
5-1/2	21.90	E	IEU	5 1/2 FH	5.500	0.361	5.688	7.000	4.000	8.000	10.000	6.719	23.81
5-1/2	21.90	X	IEU	5 1/2 FH	5.500	0.361	5.688	7.000	3.750	8.000	10.000	6.719	24.43
5-1/2	21.90	G	IEU	5 1/2 FH	5.500	0.361	5.688	7.250	3.500	8.000	10.000	6.719	25.28
5-1/2	21.90	S	IEU	5 1/2 FH	5.500	0.361	5.688	7.500	3.000	8.000	10.000	7.094	26.39
5-1/2	24.70	E	IEU	5 1/2 FH	5.500	0.415	5.688	7.000	4.000	8.000	10.000	6.719	26.33

Designations ^a					Pipe body OD	Pipe wall thickness	Drill pipe weld neck	Tool joint				RSC bevel dia.	Approx. mass ^c
								OD	Pin ID	Pin OD length	Box OD length		
Nominal OD	Nominal Weight lb/ft	Grade	Upset type	RSC type ^d	D_{dp} in	t in -12.5%	D_{te}^b in max.	D in ± 0.031	d_p in $+0.016$ -0.031	L_{pb} in ± 0.250	L_b in ± 0.250	D_f in ± 0.016	W_{dp} lb/ft Calculated
1	2	3	4	5	6	7	8	9	10	11	12	13	14
Internal-external upset, IEU													
5-1/2	21.90	S	IEU	5 1/2 FH	5.500	0.361	5.688	7.500	3.000	8.000	10.000	7.094	26.39
5-1/2	24.70	E	IEU	5 1/2 FH	5.500	0.415	5.688	7.000	4.000	8.000	10.000	6.719	26.33
5-1/2	24.70	X,G	IEU	5 1/2 FH	5.500	0.415	5.688	7.250	3.500	8.000	10.000	6.719	27.77
5-1/2	24.70	S	IEU	5 1/2 FH	5.500	0.415	5.688	7.500	3.000	8.000	10.000	7.094	28.87
6-5/8	25.20	E	IEU	6 5/8 FH	6.625	0.330	6.938	8.000	5.000	8.000	11.000	7.703	27.57
6-5/8	25.20	X	IEU	6 5/8 FH	6.625	0.330	6.938	8.000	5.000	8.000	11.000	7.703	27.57
6-5/8	25.20	G	IEU	6 5/8 FH	6.625	0.330	6.938	8.250	4.750	8.000	11.000	7.703	28.63
6-5/8	25.20	S	IEU	6 5/8 FH	6.625	0.330	6.938	8.500	4.250	8.000	11.000	7.703	30.06
6-5/8	27.70	E	IEU	6 5/8 FH	6.625	0.362	6.938	8.000	5.000	8.000	11.000	7.703	29.43
6-5/8	27.70	X,G	IEU	6 5/8 FH	6.625	0.362	6.938	8.250	4.750	8.000	11.000	7.703	30.48
6-5/8	27.70	S	IEU	6 5/8 FH	6.625	0.362	6.938	8.500	4.250	8.000	11.000	7.703	31.91

REMARKS

- a Designations are shown for the purpose of ordering identification.
b D_{te} is held to a maximum to ensure fit with elevator.
c These values have been based on a drill-pipe-body length of 29.4 ft and are provided for information only. For other lengths, see API RP 7G for the method of calculation.
d The RSC type indicates the size and style of the applicable rotary shouldered connection.

ON INQUIRIES AND ORDERS PLEASE SPECIFY:

- Quantity
- Nominal OD
- Nominal weight, lb/ft
- Grade
- Upset type
- RSC type or other special connections
- Tool joint outside diameter
- Tool joint inside diameter at the pin end
- Length of pin tool joint outside diameter
- Length of box tool joint outside diameter
- Hardbanding: type, location, dimensions and acceptance criteria
- Pipe coatings: internal and/or external (type of coating)
- Thread protector type
- Marking requirements