



Heavy Weight Tuff Tube

In the 1960s, Heavy Weight Drill Pipe was manufactured from existing old drill collar 4145HT material. As the existing stocks of older drill collars started to diminish, the industry turned to an economic solution to use 1340 steel for the tube and 4145HT for tool joints. The American Petroleum Institute (API) built today's specifications around the 1340 steel.

TUFF TUBE Heavy Weight Drill Pipe is a new generation design using micro alloyed steel far surpassing the industry standard for heavy weight design. TUFF TUBE was designed to better resist the wear and fatigue seen in



highly deviated wells as well as aggressive directional planning. TUFF TUBE uses a proprietary micro alloyed tube and forged steel tool joints. As its predecessor, TUFF TUBE is available in standard or spiraled designs, making it flexible in a number of applications. A comparison chart is shown of how TUFF TUBE measures against API and NS-1 standards.

	API	TUFF	NS-1
Yield	55K	70K	55K
Tensile	95K	100K	95K
HRC	N/A	10	30
Tube Charpy (ft-lbs)	N/A	25@-4°F	31@ 70°F
TJ Charpy (ft-lbs)	N/A	31@-4°F	31@ 70°F
Weld Line Charpy (ft-lbs)	N/A	15@-4°F	31@ 70°F

Features and Benefits

- In addition to the same features and benefits as traditional heavy weight, TUFF TUBE offers:
 - Using forged tool joints, it provides a reduce wear rate on the OD and extends the service life over traditional heavy weight
 - More compression loads in drilling can be achieved on highly deviated or horizontal wells
 - Increased impact values (Charpy)
- Cold rolling the thread roots on all Heavy Weight Drill Pipe connections increases the connection's ability to resist fatigue cracking
- Higher weld impact values



Optional Features

- Hardbanding placed on the tool joints and center wear pad will increase abrasion resistance and extend service life
- Internal Plastic Coating to reduce corrosion and extend life cycle



Advantages

- Improved wear and fatigue compared to traditional heavy weight on both tool joint and tube areas
- Designed for today's aggressive well planning

Spiral Heavy Weight Drill Pipe*

Nominal Size	Tube					Tool Joint				Weight (lb)		Minimum Make-up Torque (ft-lb)				
	Nominal Tube Dimensions			Center Upsets	End Upsets	Mechanical Properties Tube		Connection Size and Type	OD	ID	Mechanical Properties Tool Joint		Approx. Incl. Tube & Tool Joints			
ID	Wall Thickness	Area (in. ²)	Tensile Yield (lb)			Torsional Yield (ft-lb)	Tensile Yield (lb)				Torsional Yield (ft-lb)	Per foot	Per Joint (31 ft)			
3 1/2	2 1/16	0.719	6.282	4	3 7/8	345,500	19,600	NC38 (3 1/2 IF)	4 7/8	2 1/8	842,400	22,900	30.00	930	11,500	
3 1/2	2 1/4	0.625	5.645	4	3 7/8	310,500	18,500	NC38 (3 1/2 IF)	4 7/8	2 1/4	790,900	22,900	27.83	863	11,500	
								DS38	4 7/8	30,600		12,900				
								DT38	4 7/8	34,200		12,900				
4	2 9/16	0.719	7.411	4 1/2	4 3/16	407,600	27,600	NC40 (4 FH)	5 1/4	2 9/16	838,300	27,800	33.49	1,038	13,900	
4 1/2	2 3/4	0.875	9.965	5	4 11/16	548,100	40,700	NC46 (4 IF)	6 1/4	2 13/16	1,151,100	43,600	45.31	1,405	21,800	
								DS46	6 1/4	2 13/16	1,151,100	60,300				26,100
5	3	1.000	12.566	5 1/2	5 1/8	691,200	56,500	NC50 (4 1/2 IF)	6 5/8	3	1,416,200	57,800	61.71	1,913	28,900	
								DS50				82,900				34,600
								DT50				88,800				34,900
5 1/2	3 1/4	1.125	15.463	6	5 11/16	850,400	75,900	5 1/2 FH	7 1/4	3 1/4	1,778,300	78,700	65.06	2,017	39,400	
								DS55				111,100				45,500
								DT55				115,100				45,400
6 5/8	4 1/2	1.063	18.574	7 1/8	6 15/16	1,021,600	118,900	6 5/8 FH	8	4 1/2	1,896,100	87,900	74.44	2,308	43,900	

* Also applicable to our proprietary TUFF TUBE Spiral Heavy Weight Drill Pipe.

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