

PERFORATOR® GmbH



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PERFORATOR GmbH

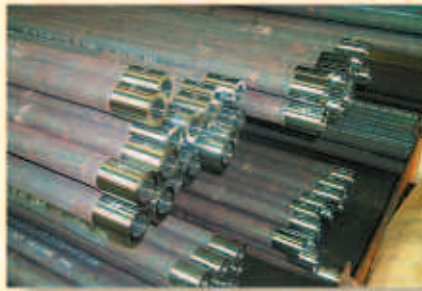
Oil and Gasfield Drill Pipes

PERFORATOR® Oil and Gasfield Drill Pipes

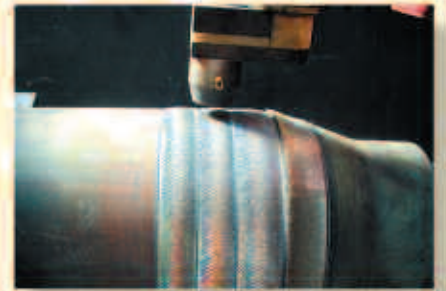
- ✓ API approved
- ✓ Mother pipe in grade E, X, G + S
- ✓ Tool joint material SAE 4145
- ✓ Dimensions up to 5" pipe and API 5 1/2 IF tool joint
- ✓ Hard facing acc. to ARNCO 100 XT, 200 XT, 300 XT
- ✓ Non-destructive testing
 - Irradiation test acc. DIN EN 1435/A
 - Ultrasonic test acc. DIN EN 1712/1713 and
 - Magnetic powder test acc. DIN EN 1290
- ✓ Destructive testing
 - Tensile test acc. DIN 50125
 - Bending test acc. API SPEC 7, latest edition
 - Notched bar impact test acc. DIN 50115



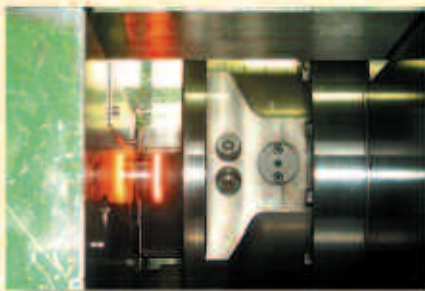
1. Engineering



2. Pipes



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PERFORATOR® Drill Pipe and Tool Joint Grades

Drill Pipe

Internal Upset	IU
External Upset	EU
Internal-External Upset	IEU
acc. to API Spec. 5D	

Friction welded Tool Joints

Numbered Connections	NC
Internal Flush	IF
Full Hole	FH

Additional requirements can be designed and supplied on request.

DRILL PIPE AND TOOL JOINT GRADES

Mechanical properties of API drill pipe grades					
Grade	Yield strength		Tensile strength	Elongation ¹ in 2 inches % min.	API
	psi N/mm ² min.	psi N/mm ² max.			
E - 75	75 000 515	105 000 725	100 000 690	see footnote	Spec. 5 D
X - 95	95 000 655	125 000 860	105 000 725		Spec. 5 D
G-105	105 000 725	135 000 930	115 000 795		Spec. 5 D
S -135	135 000 930	165 000 1 140	145 000 1 000		Spec. 5 D
Mechanical properties of API tool joint grades					
Yield strength psi N/mm ² min.	Tensile strength psi N/mm ² min.	Elongation in 2 inches % min.	Box Hardness Brinell min.	API	
120 000 827	140 000 965	13	285	Spec. 7	

¹ The minimum elongation in 2 inches (50.80 mm) shall be that determined by the following formula:

$$e = 625.000 \frac{A^{0.2}}{U^{0.9}}$$

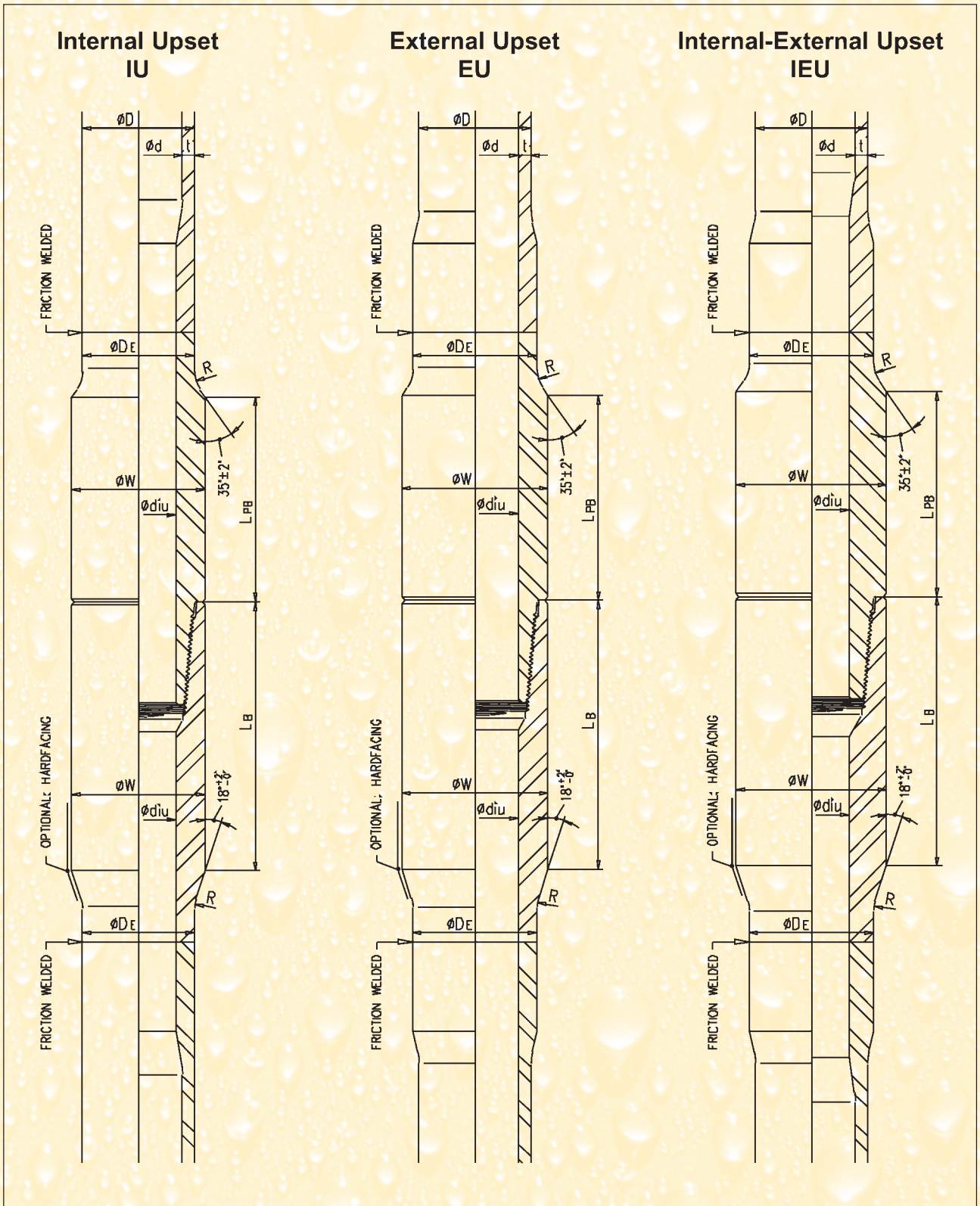
where:

e = minimum elongation in 2 inches (50.80 mm) in percent rounded to nearest 1/2 percent.

A = cross sectional area of the tensile test specimen in square inches, based on specified outside diameter or nominal specimen width, and specified wall thickness, rounded to the nearest 0.01 sq.in., or 0.75 sq.in., whichever is smaller.

U = specified tensile strength, psi.

Dimensions of Drill Pipe with Weld-On Tool Joints



Treatment of Thread Surfaces

The tool joint threads are phosphated and in connection with the thread dope, according to API BUL 7A1, this provides an excellent surface treatment to avoid galling during make-up and break-out.

As an alternative, copper plated threads can be supplied on request.

PERFORATOR® Drill Pipe: Dimensions and Performance Properties

1	2	3	4	5	6	7	8	9	10	11	12	13	
Pipe Data													
Size: Outside Diameter	Nominal Weight	Wall Thickness	Inside Diameter	Section Area Pipe Body	Type Upset	Grade	Performance Properties						
							Pipe				Tool Joint		
							Collapse Resistance	Internal Yield Pressure	Tensile Yield	Torsional Yield	Tensile Yield	Torsional Yield	
D		t	d	A			P _c	P _i					
in. mm	lb/ft kg/m	in. mm	sq.in. cm ²				psi bar	lb kN	ft-lb Nm	lb kN	ft-lb Nm		
2 3/8 60,3	6.65 9,90	0.280 7,11	1.815 46,10	1.8429 11,89	EU	E	15 600 1 076	15 470 1 067	138 220 615	6 250 8 470	313 680 1 396	6 800 9 220	
					EU	X	19 760 1 362	19 600 1 351	175 080 779	7 920 10 740	313 680 1 396	6 800 9 220	
					EU	G	21 840 1 506	21 660 1 493	193 500 861	8 750 11 860	313 680 1 396	6 800 9 220	
2 7/8 73,0	6.85 10,19	0.217 5,51	2.441 62,00	1.8120 11,69	EU	E	10 467 722	9 907 683	135 902 605	8 083 10 960	447 131 1 990	11 871 16 090	
					EU	X	12 940 892	12 548 865	172 143 766	10 238 13 880	447 131 1 990	11 871 16 090	
					EU	G	14 020 967	13 869 956	190 263 847	11 316 15 340	447 131 1 990	11 871 16 090	
2 7/8 73,0	8.60 12,80	0.308 7,82	2.260 57,40	2.4831 16,02	EU	E	14 348 989	14 061 970	186 290 829	10 413 14 120	313 682 1 396	6 875 9 320	
											447 131 1 990	11 871 16 090	
					EU	X	18 174 1 253	17 810 1 228	235 967 1 050	13 190 17 880	313 682 1 396	6 875 9 320	
											447 131 1 990	11 871 16 090	
					EU	G	20 087 1 385	19 685 1 357	260 805 1 161	14 578 19 760	313 682 1 396	6 875 9 320	
											447 131 1 990	11 871 16 090	
2 7/8 73,0	10.40 15,48	0.362 9,19	2.151 54,64	2.8579 18,44	EU	E	16 509 1 138	16 526 1 139	214 345 954	11 550 15 660	447 131 1 990	11 871 16 090	
					EU	X	20 911 1 442	20 933 1 443	271 504 1 208	14 635 19 840	495 727 2 206	13 196 17 890	
											447 131 1 990	11 871 16 090	
					EU	G	23 112 1 594	23 137 1 595	300 083 1 335	16 176 21 930	495 727 2 206	13 196 17 890	
						29 716 2 049	29 747 2 051	385 821 1 717	20 800 28 200	623 846 2 776	16 946 22 980		

PERFORATOR® Drill Pipe: Dimensions and Performance Properties

	14	15	16	17	18	19	20	21	22	23	24	25	26
Tool Joint Data									Drill Pipe Data				
Connection Type	Diameter of Pin and Box			Tong Space Length of		Cross Sectional Area of		Adjusted Weight*	Make-Up Torque	Torsional Ratio, Pin to Pipe	Capacity	Total Displacement**	
	Outside	Inside	Elevator Upset	Pin	Box	Pin	Box						
	W	d _{iu}	DE	LPB	LB	AP	AB						
	in. mm					sq.in. cm ²		lb/ft kg/m	ft-lb Nm	US gal./ft l/m			
NC 26 (2 3/8 IF)	3 3/8	1 3/4	2 9/16	7	8	2.531	2.457	7.05	3 500	1.09	0.134	0.241	
	85,7	44,5	65,1	177,8	203,2	16,33	15,85	10,5	4 750		1,664	2,993	
NC 26 (2 3/8 IF)	3 3/8	1 3/4	2 9/16	7	8	2.531	2.457	7.05	3 500	0.86	0.134	0.241	
	85,7	44,5	65,1	177,8	203,2	16,33	15,85	10,5	4 750		1,664	2,993	
NC 26 (2 3/8 IF)	3 3/8	1 3/4	2 9/16	7	8	2.531	2.457	7.05	3 500	0.78	0.134	0.241	
	85,7	44,5	65,1	177,8	203,2	16,33	15,85	10,5	4 750		1,664	2,993	
NC 31 (2 7/8 IF)	4 1/8	2 1/8	3 3/16	7	9	3.627	4.337	7.73	5 935	1.47	0.238	0.356	
	104,8	54,0	81,0	177,8	228,6	23,40	27,98	11,5	8 050		2,96	4,42	
NC 31 (2 7/8 IF)	4 1/8	2 1/8	3 3/16	7	9	3.627	4.337	7.73	5 935	1.16	0.238	0.356	
	104,8	54,0	81,0	177,8	228,6	23,40	27,98	11,5	8 050		2,96	4,42	
NC 31 (2 7/8 IF)	4 1/8	2 1/8	3 3/16	7	9	3.627	4.337	7.73	5 935	1.05	0.238	0.356	
	104,8	54,0	81,0	177,8	228,6	23,40	27,98	11,5	8 050		2,96	4,42	
NC 26 (2 3/8 IF)	3 3/8	1 3/4	3	7	8	2.531	2.457	9.33	3 438	0.52	0.201	0.343	
	85,7	44,5	76,2	177,8	203,2	16,33	15,85	13,9	4 660		2,497	4,260	
NC 31 (2 7/8 IF)	4 1/8	2 1/8	3 3/16	7	9	3.627	4.337	9.81	5 935	1.14	0.206	0.356	
	104,8	54,0	81,0	177,8	228,6	23,40	27,98	14,6	8 050		2,56	4,42	
NC 26 (2 3/8 IF)	3 3/8	1 3/4	3	7	8	2.531	2.457	9.33	3 438	0.52	0.201	0.343	
	85,7	44,5	76,2	177,8	203,2	16,33	15,85	13,9	4 660		2,50	4,26	
NC 31 (2 7/8 IF)	4 1/8	2 1/8	3 3/16	7	9	3.627	4.337	9.81	5 935	0.90	0.206	0.356	
	104,8	54,0	81,0	177,8	228,6	23,40	27,98	14,6	8 050		2,56	4,42	
NC 26 (2 3/8 IF)	3 3/8	1 3/4	3	7	8	2.531	2.457	9.33	3 438	0.47	0.201	0.343	
	85,7	44,5	76,2	177,8	203,2	16,33	15,85	13,9	4 660		2,50	4,26	
NC 31 (2 7/8 IF)	4 1/8	2 1/8	3 3/16	7	9	3.627	4.337	9.81	5 935	0.81	0.206	0.356	
	104,8	54,0	81,0	177,8	228,6	23,40	27,98	14,6	8 050		2,56	4,42	
NC 31 (2 7/8 IF)	4 1/8	2	3 3/16	7	9	4.032	4.337	9.93	6 598	0.70	0.204	0.356	
	104,8	50,8	81,0	177,8	228,6	26,01	27,98	14,8	8 950		2,53	4,42	
NC 31 (2 7/8 IF)	4 1/8	2 1/8	3 3/16	7	9	3.627	4.337	10.96	5 935	1.03	0.189	0.356	
	104,8	54,0	81,0	177,8	228,6	23,40	27,98	16,3	8 050		2,348	4,422	
NC 31 (2 7/8 IF)	4 1/8	2	3 3/16	7	9	4.032	4.337	11.08	6 598	0.90	0.187	0.356	
	104,8	50,8	81,0	177,8	228,6	26,01	27,98	16,5	8 950		2,32	4,42	
NC 31 (2 7/8 IF)	4 1/8	2 1/8	3 3/16	7	9	3.627	4.337	10.96	5 935	0.81	0.189	0.356	
	104,8	54,0	81,0	177,8	228,6	23,40	27,98	16,3	8 050		2,35	4,42	
NC 31 (2 7/8 IF)	4 1/8	2	3 3/16	7	9	4.032	4.337	11.08	6 598	0.82	0.187	0.356	
	104,8	50,8	81,0	177,8	228,6	26,01	27,98	16,5	8 950		2,32	4,42	
NC 31 (2 7/8 IF)	4 3/8	1 5/8	3 3/16	7	9	5.099	6.006	11.72	8 473	0.81	0.184	0.363	
	111,1	41,3	81,0	177,8	228,6	32,90	38,75	17,4	11 490		2,29	4,51	

* Weight of the pipe / tool joint assembly is based on the average pipe length of 29.4 ft plus tool joint length.

** Including drill pipe volume.

PERFORATOR® Drill Pipe: Dimensions and Performance Properties

1	2	3	4	5	6	7	8	9	10	11	12	13		
Pipe Data														
Size: Outside Diameter D	Nominal Weight	Wall Thickness t	Inside Diameter d	Section Area Pipe Body A	Type Upset	Grade	Performance Properties							
							Pipe				Tool Joint			
							Collapse Resistance P _c	Internal Yield Pressure P _i	Tensile Yield	Torsional Yield	Tensile Yield	Torsional Yield		
in. mm	lb/ft kg/m	in. mm	sq.in. cm ²			psi bar	lb kN	ft-lb Nm	lb kN	ft-lb Nm				
3 1/2 88,9	9.50 14,14	0.254 6,45	2.992 76,00	2.5902 16,71	EU	E	10 001	9 530	194 265	14 146	419 798	12 813		
							690	657	864	19 180	1 868	17 370		
											587 309	18 107		
										2 614	24 550			
							X	12 080	12 070	246 069	17 918	587 309	18 107	
								833	832	1 095	24 290	2 614	24 550	
						G	13 060	13 340	271 971	19 805	587 309	18 107		
							900	920	1 210	26 850	2 614	24 550		
						S	15 750	17 150	349 677	25 463	587 309	18 107		
							1 086	1 182	1 556	34 520	2 614	24 550		
					3 1/2 88,9	13.30 19,79	0.368 9,35	2.764 70,21	3.6209 23,36	EU	E	14 110	13 800	271 570
973	952	1 208	25 150	2 614								24 550		
	X	17 880	17 480	343 989							23 498	649 160	20 326	
		1 233	1 205	1 531							31 860	2 889	27 560	
												587 309	18 107	
											2 614	24 550		
	G	19 760	19 320	380 198						25 972	708 065	22 213		
		1 362	1 332	1 692						35 210	3 151	30 120		
											649 160	20 326		
											2 889	27 560		
											587 309	18 107		
						2 614	24 550							
	S	25 400	24 840	488 826	33 393	842 442	26 515							
		1 751	1 713	2 175	45 270	3 749	35 950							
						708 065	22 213							
						3 151	30 120							
						776 408	25 673							
						3 455	34 810							
						838 258	27 760							
						3 730	37 640							

PERFORATOR® Drill Pipe: Dimensions and Performance Properties

	14	15	16	17	18	19	20	21	22	23	24	25	26
Tool Joint Data									Drill Pipe Data				
Connection Type	Diameter of Pin and Box			Tong Space Length of		Cross Sectional Area of		Adjusted Weight*	Make-Up Torque	Torsional Ratio, Pin to Pipe	Capacity	Total Displacement**	
	Outside	Inside	Elevator Upset	Pin	Box	Pin	Box						
	W	d _{iu}	DE	LPB	LB	AP	AB						
	in. mm					sq.in. cm ²		lb/ft kg/m	ft-lb Nm		US gal./ft l/m		
NC 38****	4 3/4	3	3 7/8	8	10.5	3.378	5.052	10.46	6 407	0.91	0.366	0.525	
	120,7	76,2	98,4	203,2	266,7	21,79	32,59	15,6	8 690		4,546	6,521	
NC 38 (3 1/2 IF)	4 3/4	2 11/16	3 7/8	8	10.5	4.774	5.052	10.91	9 054	1.28	0.359	0.525	
	120,7	68,3	98,4	203,2	266,7	30,80	32,59	16,2	12 280		4,46	6,52	
NC 38 (3 1/2 IF)	4 3/4	2 11/16	3 7/8	8	10.5	4.774	5.052	10.91	9 054	1.01	0.359	0.525	
	120,7	68,3	98,4	203,2	266,7	30,80	32,59	16,2	12 280		4,46	6,52	
NC 38 (3 1/2 IF)	4 3/4	2 11/16	3 7/8	8	10.5	4.774	5.052	10.91	9 054	0.91	0.359	0.525	
	120,7	68,3	98,4	203,2	266,7	30,80	32,59	16,2	12 280		4,46	6,52	
NC 38 (3 1/2 IF)	4 3/4	2 11/16	3 7/8	8	10.5	4.774	5.052	10.91	9 054	0.71	0.359	0.525	
	120,7	68,3	98,4	203,2	266,7	30,80	32,59	16,2	12 280		4,46	6,52	
NC 38 (3 1/2 IF)	4 3/4	2 11/16	3 7/8	8	10.5	4.774	5.052	14.08	9 054	0.98	0.310	0.525	
	120,7	68,3	98,4	203,2	266,7	30,80	32,59	21,0	12 280		3,851	6,521	
NC 38 (3 1/2 IF)	5	2 9/16	3 7/8	8	10.5	5.290	6.966	14.60	10 163	0.87	0.308	0.531	
	127,0	65,1	98,4	203,2	266,7	34,13	44,94	21,7	13 780		3,83	6,60	
NC 38 (3 1/2 IF)	4 3/4	2 11/16	3 7/8	8	10.5	4.774	5.052	14.08	9 054	0.77	0.310	0.525	
	120,7	68,3	98,4	203,2	266,7	30,80	32,59	21,0	12 280		3,85	6,52	
NC 38 (3 1/2 IF)	5	2 7/16	3 7/8	8	10.5	5.781	6.966	14.75	11 106	0.86	0.305	0.531	
	127,0	61,9	98,4	203,2	266,7	37,30	44,94	22,0	15 060		3,79	6,60	
NC 38 (3 1/2 IF)	5	2 9/16	3 7/8	8	10.5	5.290	6.966	14.60	10 163	0.78	0.308	0.531	
	127,0	65,1	98,4	203,2	266,7	34,13	44,94	21,7	13 780		3,83	6,60	
NC 38 (3 1/2 IF)	4 3/4	2 11/16	3 7/8	8	10.5	4.774	5.052	14.08	9 054	0.70	0.310	0.525	
	120,7	68,3	98,4	203,2	266,7	30,80	32,59	21,0	12 280		3,85	6,52	
NC 38 (3 1/2 IF)	5	2 1/8	3 7/8	8	10.5	6.900	6.966	15.10	13 258	0.79	0.3	0.531	
	127,0	54,0	98,4	203,2	266,7	44,52	44,94	22,5	17 980		3,73	6,60	
NC 38 (3 1/2 IF)	5	2 7/16	3 7/8	8	10.5	5.781	6.966	14.75	11 106	0.67	0.305	0.531	
	127,0	61,9	98,4	203,2	266,7	37,30	44,94	22,0	15 060		3,79	6,60	
NC 40 (4 FH)	5 1/4	2 11/16	3 7/8	7	10	6.342	7.260	14.83	12 837	0.77	0.31	0.537	
	133,4	68,3	98,4	177,8	254,0	40,92	46,84	22,1	17 400		3,85	6,67	
NC 40 (4 FH)	5 1/4	2 9/16	3 7/8	7	10	6.857	7.260	14.99	13 880	0.83	0.308	0.537	
	133,4	65,1	98,4	177,8	254,0	44,24	46,84	22,3	18 820		3,83	6,67	

* Weight of the pipe / tool joint assembly is based on the average pipe length of 29.4 ft plus tool joint length. ** Including drill pipe volume.

PERFORATOR® Drill Pipe: Dimensions and Performance Properties

1	2	3	4	5	6	7	8	9	10	11	12	13	
Pipe Data													
Size: Outside Diameter	Nominal Weight	Wall Thickness	Inside Diameter	Section Area Pipe Body	Type Upset	Grade	Performance Properties						
							Pipe				Tool Joint		
							Collapse Resistance	Internal Yield Pressure	Tensile Yield	Torsional Yield	Tensile Yield	Torsional Yield	
D		t	d	A			P _c	P _i					
in. mm	lb/ft kg/m	in. mm	sq.in. cm ²				psi bar	lb kN	ft-lb Nm	lb kN	ft-lb Nm		
3 1/2 88,9	15.50 23,07	0.449 11,40	2.602 66,09	4.3037 27,77	EU	E	16 770 1 156	16 840 1 161	322 776 1 436	21 086 28 590	649 160	20 326	
											2 889	27 560	
											708 065	22 213	
											3 151	30 120	
											649 160	19 174	
											2 889	26 000	
					708 065	19 174							
					3 151	26 000							
					EU	X	21 250 1 465	21 330 1 471	408 849 1 819	26 708 36 210	649 160 2 889	20 326 27 560	
							708 065 3 151	22 213 30 120					
					EU	G	23 480 1 619	23 570 1 625	451 886 2 011	29 520 40 020	842 442 3 749	26 515 35 950	
							708 065 3 151	22 213 30 120					
		838 258 3 730	27 760 37 640										
EU	S	30 190 2 082	30 310 2 090	580 996 2 585	37 954 51 460	979 999 4 361	32 943 44 660						

PERFORATOR® Drill Pipe: Dimensions and Performance Properties

	14	15	16	17	18	19	20	21	22	23	24	25	26
Tool Joint Data									Drill Pipe Data				
Connection Type	Diameter of Pin and Box			Tong Space Length of		Cross Sectional Area of		Adjusted Weight*	Make-Up Torque	Torsional Ratio, Pin to Pipe	Capacity	Total Displacement**	
	Outside	Inside	Elevator Upset	Pin	Box	Pin	Box						
	W	d _{iu}	DE	LPB	LB	AP	AB						
	in. mm					sq.in. cm ²		lb/ft kg/m	ft-lb Nm		US gal./ft l/m		
NC 38 (3 1/2 IF)	5	2 9/16	3 7/8	8	10.5	5.290	6.966	16.68	10 163	0.96	0.276	0.531	
	127,0	65,1	98,4	203,2	266,7	34,13	44,94	24,8	13 780		3,428	6,596	
NC 38 (3 1/2 IF)	5	2 7/16	3 7/8	8	10.5	5.781	6.966	16.84	11 106	1.05	0.273	0.531	
	127,0	61,9	98,4	203,2	266,7	37,30	44,94	25,1	15 060		3,39	6,60	
NC 38 (3 1/2 IF)	4 3/4	2 9/16	3 7/8	8	10.5	5.290	5.052	16.33	9 587	0.91	0.276	0.525	
	120,7	65,1	98,4	203,2	266,7	34,13	32,59	24,3	13 000		3,43	6,52	
NC 38 (3 1/2 IF)	4 3/4	2 7/16	3 7/8	8	10.5	5.781	5.052	16.49	9 587	0.91	0.273	0.525	
	120,7	61,9	98,4	203,2	266,7	37,30	32,59	24,5	13 000		3,39	6,52	
NC 38 (3 1/2 IF)	5	2 9/16	3 7/8	8	10.5	5.290	6.966	16.68	10 163	0.76	0.276	0.531	
	127,0	65,1	98,4	203,2	266,7	34,13	44,94	24,8	13 780		3,43	6,60	
NC 38 (3 1/2 IF)	5	2 7/16	3 7/8	8	10.5	5.781	6.966	16.84	11 106	0.83	0.273	0.531	
	127,0	61,9	98,4	203,2	266,7	37,30	44,94	25,1	15 060		3,39	6,60	
NC 38 (3 1/2 IF)	5	2 1/8	3 7/8	8	10.5	6.900	6.966	17.19	13 258	0.90	0.268	0.531	
	127,0	54,0	98,4	203,2	266,7	44,52	44,94	25,6	17 980		3,33	6,60	
NC 38 (3 1/2 IF)	5	2 7/16	3 7/8	8	10.5	5.781	6.966	16.84	11 106	0.75	0.273	0.531	
	127,0	61,9	98,4	203,2	266,7	37,30	44,94	25,1	15 060		3,39	6,60	
NC 40 (4 FH)	5 1/4	2 9/16	3 7/8	7	10	6.857	7.260	17.08	13 880	0.94	0.276	0.537	
	133,4	65,1	98,4	177,8	254,0	44,24	46,84	25,4	18 820		3,43	6,67	
NC 40 (4 FH)	5 1/2	2 1/4	3 7/8	7	10	8.038	9.371	17.81	16 472	0.87	0.271	0.543	
	139,7	57,2	98,4	177,8	254,0	51,86	60,46	26,5	22 330		3,37	6,74	

* Weight of the pipe / tool joint assembly is based on the average pipe length of 29.4 ft plus tool joint length.

** Including drill pipe volume.

PERFORATOR® Drill Pipe: Dimensions and Performance Properties

1	2	3	4	5	6	7	8	9	10	11	12	13
Pipe Data												
Size: Outside Diameter	Nominal Weight	Wall Thickness	Inside Diameter	Section Area Pipe Body	Type Upset	Grade	Performance Properties					
							Pipe				Tool Joint	
							Collapse Resistance	Internal Yield Pressure	Tensile Yield	Torsional Yield	Tensile Yield	Torsional Yield
D		t	d	A			P _c	P _i				
in. mm	lb/ft kg/m	in. mm	sq.in. cm ²				psi bar	lb kN	ft-lb Nm	lb kN	ft-lb Nm	
4 101,6	14.00 20,83	0.330 8,38	3.340 84,84	3.8048 24,55	IU	E	11 350	10 830	285 359	23 288	711 613	23 487
							783	747	1 270	31 570	3 167	31 840
					EU	E	11 350	10 830	285 359	23 288	901 167	33 625
							783	747	1 270	31 570	4 010	45 590
					IU	X	14 380	13 720	361 455	29 498	776 408	25 673
							992	946	1 608	39 990	3 455	34 810
					EU	X	14 380	13 720	361 455	29 498	901 167	33 625
							992	946	1 608	39 990	4 010	45 590
					IU	G	15 900	15 160	399 503	32 603	897 163	30 114
							1 096	1 045	1 778	44 200	3 992	40 830
					EU	G	15 900	15 160	399 503	32 603	901 167	33 625
							1 096	1 045	1 778	44 200	4 010	45 590
					IU	S	20 140	19 490	513 647	41 918	1 080 137	36 363
							1 389	1 344	2 286	56 830	4 807	49 300
					EU	S	20 140	19 490	513 647	41 918	1 048 429	39 230
							1 389	1 344	2 286	56 830	4 666	53 190
4 1/2 114,3	13.75 20,46	0.271 6,88	3.958 100,53	3.6004 23,23	IU	E	7 170	7 900	270 034	25 908	823 118	30 655
							494	545	1 202	35 130	3 663	41 560
EU	E	7 170	7 900	270 034	25 908	849 268	33 824					
		494	545	1 202	35 130	3 779	45 860					

PERFORATOR® Drill Pipe: Dimensions and Performance Properties

	14	15	16	17	18	19	20	21	22	23	24	25	26
Tool Joint Data									Drill Pipe Data				
Connection Type	Diameter of Pin and Box			Tong Space Length of		Cross Sectional Area of		Adjusted Weight*	Make-Up Torque	Torsional Ratio, Pin to Pipe	Capacity	Total Displacement**	
	Outside	Inside	Elevator Upset	Pin	Box	Pin	Box						
	W	d _{iu}	DE	LPB	LB	AP	AB						
	in. mm					sq.in. cm ²		lb/ft kg/m	ft-lb Nm		US gal./ft l/m		
NC 40 (4 FH)	5 1/4 133,4	2 13/16 71,4	4 3/16 106,4	7 177,8	10 254,0	5.802 37,43	7.260 46,84	15.37 22,9	11 744 15 920	1.01	0.443 5,503	0.678 8,422	
NC 46 (4 IF)	6 152,4	3 1/4 82,6	4 1/2 114,3	7 177,8	10 254,0	7.363 47,50	9.853 63,57	16.05 23,9	16 813 22 800	1.44	0.453 5,63	0.699 8,68	
NC 46 (4 IF)	5 3/4 146,1	3 1/4 82,6	4 1/2 114,3	7 177,8	10 254,0	7.363 47,50	7.546 48,68	15.65 23,3	16 629 22 550	1.43	0.453 5,63	0.693 8,61	
NC 40 (4 FH)	5 1/4 133,4	2 11/16 68,3	4 3/16 106,4	7 177,8	10 254,0	6.342 40,92	7.260 46,84	15.53 23,1	12 837 17 400	0.87	0.441 5,48	0.678 8,42	
NC 40 (4 FH)	5 1/4 133,4	2 13/16 71,4	4 3/16 106,4	7 177,8	10 254,0	5.802 37,43	7.260 46,84	15.37 22,9	11 744 15 920	0.80	0.443 5,50	0.678 8,42	
NC 46 (4 IF)	6 152,4	3 1/4 82,6	4 1/2 114,3	7 177,8	10 254,0	7.363 47,50	9.853 63,57	16.05 23,9	16 813 22 800	1.14	0.453 5,63	0.699 8,68	
NC 46 (4 IF)	5 3/4 146,1	3 1/4 82,6	4 1/2 114,3	7 177,8	10 254,0	7.363 47,50	7.546 48,68	15.65 23,3	16 629 22 550	1.13	0.453 5,63	0.693 8,61	
NC 40 (4 FH)	5 1/2 139,7	2 7/16 61,9	4 3/16 106,4	7 177,8	10 254,0	7.348 47,41	9.371 60,46	16.20 24,1	15 057 20 410	0.92	0.436 5,42	0.683 8,48	
NC 40 (4 FH)	5 1/4 133,4	2 11/16 68,3	4 3/16 106,4	7 177,8	10 254,0	6.342 40,92	7.260 46,84	15.53 23,1	12 837 17 400	0.79	0.441 5,48	0.678 8,42	
NC 46 (4 IF)	6 152,4	3 1/4 82,6	4 1/2 114,3	7 177,8	10 254,0	7.363 47,50	9.853 63,57	16.05 23,9	16 813 22 800	1.03	0.453 5,63	0.699 8,68	
NC 46 (4 IF)	5 3/4 146,1	3 1/4 82,6	4 1/2 114,3	7 177,8	10 254,0	7.363 47,50	7.546 48,68	15.65 23,3	16 629 22 550	1.02	0.453 5,63	0.693 8,61	
NC 40 (4 FH)	5 1/2 139,7	2 50,8	4 3/16 106,4	7 177,8	10 254,0	8.873 57,25	9.371 60,46	16.65 24,8	18 182 24 650	0.87	0.429 5,33	0.683 8,48	
NC 40 (4 FH)	5 1/4 133,4	2 9/16 65,1	4 3/16 106,4	7 177,8	10 254,0	6.857 44,24	7.260 46,84	15.68 23,3	13 880 18 820	0.66	0.438 5,44	0.678 8,42	
NC 46 (4 IF)	6 152,4	3 76,2	4 1/2 114,3	7 177,8	10 254,0	8.590 55,42	9.853 63,57	16.43 24,5	19 615 26 590	0.94	0.448 5,56	0.699 8,68	
NC 46 (4 IF)	5 3/4 146,1	3 76,2	4 1/2 114,3	7 177,8	10 254,0	8.590 55,42	7.546 48,68	16.02 23,8	17 028 23 090	0.81	0.448 5,56	0.693 8,61	
NC 46 (4 IF)	6 152,4	3 3/8 85,7	4 11/16 119,1	7 177,8	10 254,0	6.712 43,30	9.853 63,57	15.50 23,1	15 328 20 780	1.18	0.623 7,738	0.860 10,682	
NC 50 (4 1/2 IF)	6 1/4 158,8	3 7/8 98,4	5 127,0	7 177,8	10 254,0	6.917 44,63	9.044 58,35	15.25 22,7	16 912 22 930	1.31	0.637 7,91	0.870 10,81	

* Weight of the pipe / tool joint assembly is based on the average pipe length of 29.4 ft plus tool joint length.

** Including drill pipe volume.

PERFORATOR® Drill Pipe: Dimensions and Performance Properties

1	2	3	4	5	6	7	8	9	10	11	12	13						
Pipe Data																		
Size: Outside Diameter D	Nominal Weight	Wall Thickness t	Inside Diameter d	Section Area Pipe Body A	Type Upset	Grade	Performance Properties											
							Pipe				Tool Joint							
							Collapse Resistance P _c	Internal Yield Pressure P _i	Tensile Yield	Torsional Yield	Tensile Yield	Torsional Yield						
in. mm	lb/ft kg/m	in. mm	sq.in. cm ²			psi bar	lb kN	ft-lb Nm	lb kN	ft-lb Nm								
4 1/2 114,3	16.60 24,70	0.337 8,56	3.826 97,18	4.4074 28,43	IEU	E	10 390 716	9 830 678	330 559 1 471	30 807 41 770	901 167 4 010	33 994 46 090						
											713 424 3 175	26 620 36 090						
											EU	E	10 390 716	9 830 678	330 559 1 471	30 807 41 770	939 098 4 179	37 676 51 080
																	939 098 4 179	37 485 50 820
											IEU	E	10 390 716	9 830 678	330 559 1 471	30 807 41 770	976 158 4 344	34 780 47 150
																	976 158 4 344	34 384 46 620
											IEU	X	12 760 880	12 450 858	418 708 1 863	39 022 52 910	1 048 429 4 666	39 659 53 770
																	901 167 4 010	33 994 46 090
																	901 167 4 010	33 625 45 590
											EU	X	12 760 880	12 450 858	418 708 1 863	39 022 52 910	939 098 4 179	37 676 51 080
																	939 098 4 179	37 485 50 820
											IEU	X	12 760 880	12 450 858	418 708 1 863	39 022 52 910	976 158 4 344	34 780 47 150
																	976 158 4 344	34 384 46 620
											IEU	G	13 820 953	13 760 949	462 782 2 059	43 130 58 480	1 048 429 4 666	39 659 53 770
																	1 048 429 4 666	39 230 53 190
											EU	G	13 820 953	13 760 949	462 782 2 059	43 130 58 480	939 098 4 179	37 676 51 080
																	939 098 4 179	37 485 50 820
											IEU	G	13 820 953	13 760 949	462 782 2 059	43 130 58 480	976 158 4 344	34 780 47 150
																	976 158 4 344	34 384 46 620
											IEU	S	16 770 1 156	17 690 1 220	595 005 2 648	55 453 75 180	1 183 911 5 268	44 871 60 840
																	1 048 429 4 666	39 659 53 770
											EU	S	16 770 1 156	17 690 1 220	595 005 2 648	55 453 75 180	1 109 923 4 939	44 673 60 570
																	1 109 923 4 939	44 166 59 880
											IEU	S	16 770 1 156	17 690 1 220	595 005 2 648	55 453 75 180	1 235 340 5 497	44 769 60 700
976 158 4 344	34 780 47 150																	
976 158 4 344	34 384 46 620																	

PERFORATOR® Drill Pipe: Dimensions and Performance Properties

	14	15	16	17	18	19	20	21	22	23	24	25	26
Tool Joint Data									Drill Pipe Data				
Connection Type	Diameter of Pin and Box			Tong Space Length of		Cross Sectional Area of		Adjusted Weight*	Make-Up Torque	Torsional Ratio, Pin to Pipe	Capacity	Total Displacement**	
	Outside	Inside	Elevator Upset	Pin	Box	Pin	Box						
	W	d _{iu}	DE	LPB	LB	AP	AB						
	in. mm					sq.in. cm ²		lb/ft kg/m	ft-lb Nm		US gal./ft l/m		
NC 46 (4 IF)	6 1/4 158,8	3 1/4 82,6	4 11/16 119,1	7 177,8	10 254,0	7.363 47,50	12.258 79,08	18.62 27,7	16 997 23 040	1.10	0.582 7,229	0.867 10,769	
NC 46 (4 IF)	6 152,4	3 1/4 82,6	4 11/16 119,1	7 177,8	10 254,0	7.363 47,50	9.853 63,57	18.19 27,1	13 310 18 050	0.86	0.582 7,23	0.860 10,68	
NC 50 (4 1/2 IF)	6 3/8 161,9	3 3/4 95,3	5 127,0	7 177,8	10 254,0	7.665 49,45	10.284 66,35	18.18 27,1	18 838 25 540	1.22	0.596 7,40	0.873 10,84	
NC 50 (4 1/2 IF)	6 1/4 158,8	3 3/4 95,3	5 127,0	7 177,8	10 254,0	7.665 49,45	9.044 58,35	17.97 26,7	18 742 25 410	1.22	0.596 7,40	0.870 10,81	
4 1/2 FH	6 152,4	3 76,2	4 11/16 119,1	7 177,8	10 254,0	7.919 51,09	10.320 66,58	18.58 27,7	17 390 23 580	1.13	0.576 7,15	0.860 10,68	
4 1/2 FH	5 3/4 146,1	3 76,2	4 11/16 119,1	7 177,8	10 254,0	7.919 51,09	8.013 51,70	18.18 27,1	17 192 23 310	1.12	0.576 7,15	0.854 10,61	
NC 46 (4 IF)	6 1/4 158,8	3 76,2	4 11/16 119,1	7 177,8	10 254,0	8.590 55,42	12.258 79,08	18.99 28,3	19 830 26 890	1.02	0.577 7,17	0.867 10,77	
NC 46 (4 IF)	6 1/4 158,8	3 1/4 82,6	4 11/16 119,1	7 177,8	10 254,0	7.363 47,50	12.258 79,08	18.62 27,7	16 997 23 040	0.87	0.582 7,23	0.867 10,77	
NC 46 (4 IF)	6 152,4	3 1/4 82,6	4 11/16 119,1	7 177,8	10 254,0	7.363 47,50	9.853 63,57	18.19 27,1	16 813 22 800	0.86	0.582 7,23	0.860 10,68	
NC 50 (4 1/2 IF)	6 3/8 161,9	3 3/4 95,3	5 127,0	7 177,8	10 254,0	7.665 49,45	10.284 66,35	18.18 27,1	18 838 25 540	0.97	0.596 7,40	0.873 10,84	
NC 50 (4 1/2 IF)	6 1/4 158,8	3 3/4 95,3	5 127,0	7 177,8	10 254,0	7.665 49,45	9.044 58,35	17.97 26,7	18 742 25 410	0.96	0.596 7,40	0.870 10,81	
4 1/2 FH	6 152,4	3 76,2	4 11/16 119,1	7 177,8	10 254,0	7.919 51,09	10.320 66,58	18.58 27,7	17 390 23 580	0.89	0.576 7,15	0.860 10,68	
4 1/2 FH	5 3/4 146,1	3 76,2	4 11/16 119,1	7 177,8	10 254,0	7.919 51,09	8.013 51,70	18.18 27,1	17 192 23 310	0.88	0.576 7,15	0.854 10,61	
NC 46 (4 IF)	6 1/4 158,8	3 76,2	4 11/16 119,1	7 177,8	10 254,0	8.590 55,42	12.258 79,08	18.99 28,3	19 830 26 890	0.92	0.577 7,17	0.867 10,77	
NC 46 (4 IF)	6 152,4	3 76,2	4 11/16 119,1	7 177,8	10 254,0	8.590 55,42	9.853 63,57	18.55 27,6	19 615 26 590	0.91	0.577 7,17	0.860 10,68	
NC 50 (4 1/2 IF)	6 3/8 161,9	3 3/4 95,3	5 127,0	7 177,8	10 254,0	7.665 49,45	10.284 66,35	18.18 27,1	18 838 25 540	0.87	0.596 7,40	0.873 10,84	
NC 50 (4 1/2 IF)	6 1/4 158,8	3 3/4 95,3	5 127,0	7 177,8	10 254,0	7.665 49,45	9.004 58,09	17.97 26,7	18 742 25 410	0.87	0.596 7,40	0.870 10,81	
4 1/2 FH	6 152,4	3 76,2	4 11/16 119,1	7 177,8	10 254,0	7.919 51,09	10.320 66,58	18.58 27,7	17 390 23 580	0.81	0.576 7,15	0.860 10,68	
4 1/2 FH	5 3/4 146,1	3 76,2	4 11/16 119,1	7 177,8	10 254,0	7.919 51,09	8.013 51,70	18.18 27,1	17 192 23 310	0.80	0.576 7,15	0.854 10,61	
NC 46 (4 IF)	6 1/4 158,8	2 3/4 69,9	4 11/16 119,1	7 177,8	10 254,0	9.719 62,70	12.258 79,08	19.32 28,8	22 436 30 420	0.81	0.572 7,10	0.867 10,77	
NC 46 (4 IF)	6 1/4 158,8	3 76,2	4 11/16 119,1	7 177,8	10 254,0	8.590 55,42	12.258 79,08	18.99 28,3	19 830 26 890	0.72	0.577 7,17	0.867 10,77	
NC 50 (4 1/2 IF)	6 3/8 161,9	3 1/2 88,9	5 127,0	7 177,8	10 254,0	9.089 58,64	10.284 66,35	18.62 27,7	22 336 30 280	0.81	0.589 7,32	0.873 10,84	
NC 50 (4 1/2 IF)	6 1/4 158,8	3 1/2 88,9	5 127,0	7 177,8	10 254,0	9.089 58,64	9.044 58,35	18.40 27,4	22 083 29 940	0.80	0.589 7,32	0.870 10,81	
4 1/2 FH	6 1/4 158,8	2 1/2 63,5	4 11/16 119,1	7 177,8	10 254,0	10.079 65,03	12.725 82,10	19.66 29,3	22 385 30 350	0.81	0.566 7,03	0.867 10,77	
4 1/2 FH	6 152,4	3 76,2	4 11/16 119,1	7 177,8	10 254,0	7.919 51,09	10.320 66,58	18.58 27,7	17 390 23 580	0.63	0.576 7,15	0.860 10,68	
4 1/2 FH	5 3/4 146,1	3 76,2	4 11/16 119,1	7 177,8	10 254,0	7.919 51,09	8.013 51,70	18.18 27,1	17 192 23 310	0.62	0.576 7,15	0.854 10,61	

* Weight of the pipe / tool joint assembly is based on the average pipe length of 29.4 ft plus tool joint length.

** Including drill pipe volume.

PERFORATOR® Drill Pipe: Dimensions and Performance Properties

1	2	3	4	5	6	7	8	9	10	11	12	13	
Pipe Data													
Size: Outside Diameter	Nominal Weight	Wall Thickness	Inside Diameter	Section Area Pipe Body	Type Upset	Grade	Performance Properties						
							Pipe				Tool Joint		
							Collapse Resistance	Internal Yield Pressure	Tensile Yield	Torsional Yield	Tensile Yield	Torsional Yield	
D		t	d	A			P _c	P _i					
in. mm	lb/ft kg/m	in. mm	sq.in. cm ²				psi bar	lb kN	ft-lb Nm	lb kN	ft-lb Nm		
4 1/2 114,3	20.00 29,76	0.430 10,92	3.640 92,46	5.4981 35,47	IEU	E	12 960 894	12 540 865	412 359 1 835	36 901 50 030	1 048 429 4 666	39 659 53 770	
											1 048 429 4 666	39 230 53 190	
						EU	E	12 960 894	12 540 865	412 359 1 835	36 901 50 030	1 025 983 4 566	41 235 55 910
												1 025 983 4 566	41 025 55 620
						IEU	E	12 960 894	12 540 865	412 359 1 835	36 901 50 030	976 158 4 344	34 780 47 150
												1 183 911 5 268	44 871 60 840
					IEU	X	16 420 1 132	15 890 1 096	522 321 2 324	46 741 63 370	1 048 429 4 666	39 659 53 770	
											1 025 983 4 566	41 235 55 910	
					EU	X	16 420 1 132	15 890 1 096	522 321 2 324	46 741 63 370	1 109 923 4 939	44 673 60 570	
											1 235 340 5 497	44 265 60 010	
					IEU	G	18 150 1 251	17 560 1 211	577 302 2 569	51 661 70 040	1 307 611 5 819	49 630 67 290	
											1 235 340 5 497	44 265 60 010	
											1 048 429 4 666	39 659 53 770	
											1 109 923 4 939	44 673 60 570	
					EU	G	18 150 1 251	17 560 1 211	577 302 2 569	51 661 70 040	1 268 966 5 647	50 484 68 450	
											1 419 531 6 317	53 936 73 130	
					IEU	S	23 330 1 609	22 570 1 556	742 246 3 303	66 422 90 050	1 183 911 5 268	44 871 60 840	
											1 416 229 6 302	50 484 68 450	
					EU	S	23 330 1 609	22 570 1 556	742 246 3 303	66 422 90 050	1 416 229 6 302	57 801 78 370	
											1 268 966 5 647	50 484 68 450	

PERFORATOR® Drill Pipe: Dimensions and Performance Properties

	14	15	16	17	18	19	20	21	22	23	24	25	26
Tool Joint Data									Drill Pipe Data				
Connection Type	Diameter of Pin and Box			Tong Space Length of		Cross Sectional Area of		Adjusted Weight*	Make-Up Torque	Torsional Ratio, Pin to Pipe	Capacity	Total Displacement**	
	Outside	Inside	Elevator Upset	Pin	Box	Pin	Box						
	W	d _{iu}	DE	LPB	LB	AP	AB						
	in. mm					sq.in. cm ²		lb/ft kg/m	ft-lb Nm	US gal./ft l/m			
NC 46 (4 IF)	6 1/4 158,8	3 76,2	4 11/16 119,1	7 177,8	10 254,0	8.590 55,42	12.258 79,08	22.35 33,3	19 830 26 890	1.07	0.525 6,521	0.867 10,769	
NC 46 (4 IF)	6 152,4	3 76,2	4 11/16 119,1	7 177,8	10 254,0	8.590 55,42	9.853 63,57	21.92 32,6	19 615 26 590	1.06	0.525 6,52	0.860 10,68	
NC 50 (4 1/2 IF)	6 3/8 161,9	3 5/8 92,1	5 127,0	7 177,8	10 254,0	8.389 54,12	10.284 66,35	21.76 32,4	20 617 27 950	1.12	0.541 6,72	0.873 10,84	
NC 50 (4 1/2 IF)	6 1/4 158,8	3 5/8 92,1	5 127,0	7 177,8	10 254,0	8.389 54,12	9.044 58,35	21.54 32,1	20 513 27 810	1.11	0.541 6,72	0.870 10,81	
4 1/2 FH	6 152,4	3 76,2	4 11/16 119,1	7 177,8	10 254,0	7.919 51,09	10.320 66,58	21.94 32,7	17 390 23 580	0.94	0.525 6,52	0.860 10,68	
NC 46 (4 IF)	6 1/4 158,8	2 3/4 69,9	4 11/16 119,1	7 177,8	10 254,0	9.719 62,70	12.258 79,08	22.68 33,8	22 436 30 420	0.96	0.520 6,46	0.867 10,77	
NC 46 (4 IF)	6 1/4 158,8	3 76,2	4 11/16 119,1	7 177,8	10 254,0	8.590 55,42	12.258 79,08	22.35 33,3	19 830 26 890	0.85	0.525 6,52	0.867 10,77	
NC 50 (4 1/2 IF)	6 3/8 161,9	3 5/8 92,1	5 127,0	7 177,8	10 254,0	8.389 54,12	10.284 66,35	21.76 32,4	20 617 27 950	0.88	0.541 6,72	0.873 10,84	
NC 50 (4 1/2 IF)	6 3/8 161,9	3 1/2 88,9	5 127,0	7 177,8	10 254,0	9.089 58,64	10.284 66,35	21.98 32,7	22 336 30 280	0.96	0.538 6,68	0.873 10,84	
4 1/2 FH	6 152,4	2 1/2 63,5	4 11/16 119,1	7 177,8	10 254,0	10.079 65,03	10.320 66,58	22.59 33,6	22 133 30 010	0.95	0.515 6,40	0.860 10,68	
NC 46 (4 IF)	6 1/4 158,8	2 1/2 63,5	4 11/16 119,1	7 177,8	10 254,0	10.750 69,35	12.258 79,08	22.98 34,2	24 815 33 640	0.96	0.516 6,41	0.867 10,77	
4 1/2 FH	6 152,4	2 1/2 63,5	4 11/16 119,1	7 177,8	10 254,0	10.079 65,03	10.320 66,58	22.59 33,6	22 133 30 010	0.86	0.515 6,40	0.860 10,68	
NC 46 (4 IF)	6 1/4 158,8	3 76,2	4 11/16 119,1	7 177,8	10 254,0	8.590 55,42	12.258 79,08	22.35 33,3	19 830 26 890	0.77	0.525 6,52	0.867 10,77	
NC 50 (4 1/2 IF)	6 3/8 161,9	3 1/4 82,6	5 127,0	7 177,8	10 254,0	10.414 67,19	10.284 66,35	21.98 32,7	25 242 34 220	0.98	0.532 6,61	0.873 10,84	
NC 50 (4 1/2 IF)	6 3/8 161,9	3 1/4 82,6	5 127,0	7 177,8	10 254,0	10.414 67,19	10.284 66,35	22.37 33,3	25 242 34 220	0.98	0.532 6,61	0.873 10,84	
NC 46 (4 IF)	6 1/4 158,8	2 1/4 57,2	4 11/16 119,1	7 177,8	10 254,0	11.683 75,37	12.258 79,08	23.25 34,6	26 968 36 560	0.81	0.511 6,35	0.867 10,77	
NC 46 (4 IF)	6 1/4 158,8	2 3/4 69,9	4 11/16 119,1	7 177,8	10 254,0	9.719 62,70	12.258 79,08	22.68 33,8	22 436 30 420	0.68	0.52 6,46	0.867 10,77	
NC 50 (4 1/2 IF)	6 3/8 161,9	3 76,2	5 127,0	7 177,8	10 254,0	11.642 75,11	10.284 66,35	22.73 33,8	25 242 34 220	0.76	0.526 6,53	0.873 10,84	
NC 50 (4 1/2 IF)	6 5/8 168,3	3 76,2	5 127,0	7 177,8	10 254,0	11.642 75,11	12.836 82,81	23.20 34,5	28 900 39 180	0.87	0.526 6,53	0.880 10,93	
NC 50 (4 1/2 IF)	6 3/8 161,9	3 1/4 82,6	5 127,0	7 177,8	10 254,0	10.414 67,19	10.284 66,35	22.37 33,3	25 242 34 220	0.76	0.532 6,61	0.873 10,84	

* Weight of the pipe / tool joint assembly is based on the average pipe length of 29.4 ft plus tool joint length.

** Including drill pipe volume.

PERFORATOR® Drill Pipe: Dimensions and Performance Properties

1	2	3	4	5	6	7	8	9	10	11	12	13	
Pipe Data													
Size: Outside Diameter D	Nominal Weight	Wall Thickness t	Inside Diameter d	Section Area Pipe Body A	Type Upset	Grade	Performance Properties						
							Pipe				Tool Joint		
							Collapse Resistance P _c	Internal Yield Pressure P _i	Tensile Yield	Torsional Yield	Tensile Yield	Torsional Yield	
in. mm	lb/ft kg/m	in. mm	sq.in. cm ²			psi bar	lb kN	ft-lb Nm	lb kN	ft-lb Nm			
5 127,0	16.25 24,18	0.296 7,52	4.408 111,96	4.3743 28,22	IEU	E	6 940	7 770	328 074	35 044	939 098	37 676	
							479	536	1 460	47 510	4 179	51 080	
							8 110	9 840	415 560	44 389	939 098	37 676	
							559	678	1 849	60 180	4 179	51 080	
5 127,0	19.50 29,02	0.362 9,19	4.276 108,61	5.2746 34,03	IEU	E	9 960	9 500	395 596	41 167	939 098	37 676	
							687	655	1 760	55 810	4 179	51 080	
							939 098	37 868					
							4 179	51 340					
5 127,0	19.50 29,02	0.362 9,19	4.276 108,61	5.2746 34,03	IEU	X	12 030	12 040	501 088	52 144	939 098	37 676	
							829	830	2 230	70 700	4 179	51 080	
							1 109 923	44 673					
							4 939	60 570					
5 127,0	19.50 29,02	0.362 9,19	4.276 108,61	5.2746 34,03	IEU	G	13 000	13 300	553 834	57 633	1 109 923	44 900	
							896	917	2 465	78 140	4 939	60 880	
							1 109 923	44 673					
							4 939	60 570					
5 127,0	19.50 29,02	0.362 9,19	4.276 108,61	5.2746 34,03	IEU	S	15 670	17 100	712 072	74 100	1 268 966	51 447	
							1 080	1 179	3 169	100 460	5 647	69 750	
							1 416 229	56 985					
							6 302	77 260					
5 127,0	19.50 29,02	0.362 9,19	4.276 108,61	5.2746 34,03	IEU	S	1 551 710	63 406					
							6 905	85 970					
5 127,0	19.50 29,02	0.362 9,19	4.276 108,61	5.2746 34,03	IEU	S	1 619 235	72 483					
							7 206	98 270					

PERFORATOR® Drill Pipe: Dimensions and Performance Properties

	14	15	16	17	18	19	20	21	22	23	24	25	26
Tool Joint Data									Drill Pipe Data				
Connection Type	Diameter of Pin and Box			Tong Space Length of		Cross Sectional Area of		Adjusted Weight*	Make-Up Torque	Torsional Ratio, Pin to Pipe	Capacity	Total Displacement**	
	Outside	Inside	Elevator Upset	Pin	Box	Pin	Box						
	W	d _{iu}	DE	LPB	LB	AP	AB						
	in. mm					sq.in. cm ²		lb/ft kg/m	ft-lb Nm		US gal./ft l/m		
NC 50 (4 1/2 IF)	6 3/8 161,9	3 3/4 95,3	5 1/8 130,2	7 177,8	10 254,0	7.665 49,45	10.284 66,35	18.34 27,3	18 838 25 540	1.08	0.773 9,602	1.053 13,079	
NC 50 (4 1/2 IF)	6 3/8 161,9	3 3/4 95,3	5 1/8 130,2	7 177,8	10 254,0	7.665 49,45	10.284 66,35	18.34 27,3	18 838 25 540	0.85	0.773 9,60	1.053 13,08	
NC 50 (4 1/2 IF)	6 3/8 161,9	3 3/4 95,3	5 1/8 130,2	7 177,8	10 254,0	7.665 49,45	10.284 66,35	18.34 27,3	18 838 25 540	0.77	0.773 9,60	1.053 13,08	
NC 50 (4 1/2 IF)	6 3/8 161,9	3 1/2 88,9	5 1/8 130,2	7 177,8	10 254,0	9.089 58,64	10.284 66,35	18.77 27,9	22 336 30 280	0.71	0.766 9,51	1.053 13,08	
NC 50 (4 1/2 IF)	6 3/8 161,9	3 3/4 95,3	5 1/8 130,2	7 177,8	10 254,0	7.665 49,45	10.284 66,35	21.10 31,4	18 838 25 540	0.92	0.731 9,080	1.053 13,079	
NC 50 (4 1/2 IF)	6 1/2 165,1	3 3/4 95,3	5 1/8 130,2	7 177,8	10 254,0	10.414 67,19	10.284 66,35	21.33 31,7	18 934 25 670	0.92	0.731 9,08	1.056 13,12	
NC 50 (4 1/2 IF)	6 1/4 158,8	3 3/4 95,3	5 1/8 130,2	7 177,8	10 254,0	7.665 49,45	9.044 58,35	20.89 31,1	18 742 25 410	0.91	0.731 9,08	1.050 13,04	
NC 50 (4 1/2 IF)	6 3/8 161,9	3 3/4 95,3	5 1/8 130,2	7 177,8	10 254,0	7.665 49,45	10.284 66,35	21.10 31,4	18 838 25 540	0.72	0.731 9,08	1.053 13,08	
NC 50 (4 1/2 IF)	6 3/8 161,9	3 1/2 88,9	5 1/8 130,2	7 177,8	10 254,0	9.089 58,64	10.284 66,35	21.53 32,0	22 336 30 280	0.86	0.724 8,99	1.053 13,08	
NC 50 (4 1/2 IF)	6 1/2 165,1	3 1/2 88,9	5 1/8 130,2	7 177,8	10 254,0	9.089 58,64	11.548 74,50	21.76 32,4	22 450 30 440	0.78	0.724 8,99	1.056 13,12	
NC 50 (4 1/2 IF)	6 3/8 161,9	3 1/2 88,9	5 1/8 130,2	7 177,8	10 254,0	9.089 58,64	10.284 66,35	21.53 32,0	22 336 30 280	0.78	0.724 8,99	1.053 13,08	
NC 50 (4 1/2 IF)	6 1/2 165,1	3 1/4 82,6	5 1/8 130,2	7 177,8	10 254,0	10.414 67,19	11.548 74,50	22.15 33,0	25 724 34 880	0.89	0.718 8,92	1.056 13,12	
NC 50 (4 1/2 IF)	6 1/2 165,1	3 1/4 82,6	5 1/8 130,2	7 177,8	10 254,0	10.414 67,19	11.548 74,50	22.15 33,0	25 724 34 880	0.69	0.718 8,92	1.056 13,12	
NC 50 (4 1/2 IF)	6 1/2 165,1	3 76,2	5 1/8 130,2	7 177,8	10 254,0	11.642 75,11	11.548 74,50	22.51 33,5	28 492 38 630	0.77	0.712 8,84	1.056 13,12	
NC 50 (4 1/2 IF)	6 5/8 168,3	2 3/4 69,9	5 1/8 130,2	7 177,8	10 254,0	12.771 82,39	12.836 82,81	23.07 34,3	31 703 42 980	0.86	0.708 8,79	1.060 13,17	
5 1/2 FH	7 1/4 184,2	3 1/2 88,9	5 1/8 130,2	8 203,2	10 254,0	13.316 85,91	14.468 93,34	23.42 34,9	36 241 49 140	0.98	0.724 8,99	1.082 13,44	

* Weight of the pipe / tool joint assembly is based on the average pipe length of 29.4 ft plus tool joint length.

** Including drill pipe volume.

PERFORATOR® Drill Pipe: Dimensions and Performance Properties

1	2	3	4	5	6	7	8	9	10	11	12	13	
Pipe Data													
Size: Outside Diameter	Nominal Weight	Wall Thickness	Inside Diameter	Section Area Pipe Body	Type Upset	Grade	Performance Properties						
							Pipe				Tool Joint		
							Collapse Resistance	Internal Yield Pressure	Tensile Yield	Torsional Yield	Tensile Yield	Torsional Yield	
D		t	d	A			P _c	P _i					
in. mm	lb/ft kg/m	in. mm	sq.in. cm ²				psi bar	lb kN	ft-lb Nm	lb kN	ft-lb Nm		
5 127,0	25.60 38,10	0.500 12,70	4.000 101,60	7.0686 45,60	IEU	E	13 500 931	13 120 905	530 145 2 359	52 257 70 850	1 109 923 4 939	44 673 60 570	
											939 098 4 179	37 676 51 080	
						IEU	X	17 100 1 179	16 620 1 146	671 517 2 988	66 192 89 740	1 109 923 4 939	44 900 60 880
												1 268 966 5 647	51 447 69 750
												1 416 229 6 302	56 985 77 260
												1 619 235 7 206	62 903 85 280
												1 778 278 7 913	62 903 85 280
												1 619 235 7 206	72 483 98 270
												1 778 278 7 913	78 716 106 720
												IEU	G
					1 416 229 6 302	56 985 77 260							
					1 551 710 6 905	63 406 85 970							
					1 619 235 7 206	62 903 85 280							
					IEU	S	24 300 1 675	23 620 1 629	954 261 4 246	94 062 127 530	1 619 235 7 206	62 903 85 280	
											1 778 278 7 913	62 903 85 280	
											1 619 235 7 206	72 483 98 270	
											1 778 278 7 913	78 716 106 720	

PERFORATOR® Drill Pipe: Dimensions and Performance Properties

	14	15	16	17	18	19	20	21	22	23	24	25	26
Tool Joint Data									Drill Pipe Data				
Connection Type	Diameter of Pin and Box			Tong Space Length of		Cross Sectional Area of		Adjusted Weight*	Make-Up Torque	Torsional Ratio, Pin to Pipe	Capacity	Total Displacement**	
	Outside	Inside	Elevator Upset	Pin	Box	Pin	Box						
	W	d _{iu}	DE	LPB	LB	AP	AB						
	in. mm					sq.in. cm ²		lb/ft kg/m	ft-lb Nm	US gal./ft l/m			
NC 50 (4 1/2 IF)	6 3/8 161,9	3 1/2 88,9	5 1/8 130,2	7 177,8	10 254,0	9.089 58,64	10.284 66,35	27.08 40,3	22 336 30 280	0.85	0.639 7,937	1.053 13,079	
NC 50 (4 1/2 IF)	6 3/8 161,9	3 3/4 95,3	5 1/8 130,2	7 177,8	10 254,0	7.665 49,45	10.284 66,35	26.65 39,7	18 838 25 540	0.72	0.646 8,02	1.053 13,08	
NC 50 (4 1/2 IF)	6 1/2 165,1	3 1/2 88,9	5 1/8 130,2	7 177,8	10 254,0	9.089 58,64	11.548 74,50	27.30 40,6	22 450 30 440	0.68	0.639 7,94	1.056 13,12	
NC 50 (4 1/2 IF)	6 1/2 165,1	3 1/4 82,6	5 1/8 130,2	7 177,8	10 254,0	10.414 67,19	11.548 74,50	27.69 41,2	25 724 34 880	0.78	0.633 7,86	1.056 13,12	
NC 50 (4 1/2 IF)	6 1/2 165,1	3 76,2	5 1/8 130,2	7 177,8	10 254,0	11.642 75,11	11.548 74,50	28.05 41,7	28 492 38 630	0.86	0.628 7,80	1.056 13,12	
5 1/2 FH	7 177,8	3 1/2 88,9	5 1/8 130,2	8 203,2	10 254,0	13.316 85,91	11.670 75,29	28.39 42,2	31 452 42 640	0.95	0.640 7,95	1.074 13,34	
5 1/2 FH	7 177,8	3 1/4 82,6	5 1/8 130,2	8 203,2	10 254,0	14.642 94,46	11.670 75,29	28.78 42,8	31 452 42 640	0.95	0.634 7,87	1.074 13,34	
5 1/2 FH	7 1/4 184,2	3 1/2 88,9	5 1/8 130,2	8 203,2	10 254,0	13.316 85,91	14.468 93,34	28.94 43,1	36 241 49 140	1.10	0.640 7,95	1.082 13,44	
5 1/2 FH	7 1/4 184,2	3 1/4 82,6	5 1/8 130,2	8 203,2	10 254,0	14.642 94,46	14.468 93,34	29.33 43,6	39 358 53 360	1.19	0.634 7,87	1.082 13,44	
NC 50 (4 1/2 IF)	6 1/2 165,1	3 1/4 82,6	5 1/8 130,2	7 177,8	10 254,0	10.414 67,19	11.548 74,50	27.69 41,2	25 724 34 880	0.70	0.633 7,86	1.056 13,12	
NC 50 (4 1/2 IF)	6 1/2 165,1	3 76,2	5 1/8 130,2	7 177,8	10 254,0	11.642 75,11	11.548 74,50	28.05 41,7	28 492 38 630	0.78	0.628 7,80	1.056 13,12	
NC 50 (4 1/2 IF)	6 5/8 168,3	2 3/4 69,9	5 1/8 130,2	7 177,8	10 254,0	12.771 82,39	12.836 82,81	28.61 42,6	31 703 42 980	0.87	0.623 7,74	1.060 13,17	
5 1/2 FH	7 177,8	3 1/2 88,9	5 1/8 130,2	8 203,2	10 254,0	13.316 85,91	11.670 75,29	28.39 42,2	31 452 42 640	0.86	0.640 7,95	1.074 13,34	
5 1/2 FH	7 177,8	3 1/4 82,6	5 1/8 130,2	8 203,2	10 254,0	14.642 94,46	11.670 75,29	28.78 42,8	31 452 42 640	0.86	0.634 7,87	1.074 13,34	
5 1/2 FH	7 1/4 184,2	3 1/2 88,9	5 1/8 130,2	8 203,2	10 254,0	13.316 85,91	14.468 93,34	28.94 43,1	36 241 49 140	0.99	0.640 7,95	1.082 13,44	
5 1/2 FH	7 1/4 184,2	3 1/4 82,6	5 1/8 130,2	8 203,2	10 254,0	14.642 94,46	14.468 93,34	29.33 43,6	39 358 53 360	1.08	0.634 7,87	1.082 13,44	
5 1/2 FH	7 177,8	3 1/2 88,9	5 1/8 130,2	8 203,2	10 254,0	13.316 85,91	11.670 75,29	28.39 42,2	31 452 42 640	0.67	0.640 7,95	1.074 13,34	
5 1/2 FH	7 177,8	3 1/4 82,6	5 1/8 130,2	8 203,2	10 254,0	14.642 94,46	11.670 75,29	28.78 42,8	31 452 42 640	0.67	0.634 7,87	1.074 13,34	
5 1/2 FH	7 1/4 184,2	3 1/2 88,9	5 1/8 130,2	8 203,2	10 254,0	13.316 85,91	14.468 93,34	28.94 43,1	36 241 49 140	0.77	0.640 7,95	1.082 13,44	
5 1/2 FH	7 1/4 184,2	3 1/4 82,6	5 1/8 130,2	8 203,2	10 254,0	14.642 94,46	14.468 93,34	29.33 43,6	39 358 53 360	0.84	0.634 7,87	1.082 13,44	

* Weight of the pipe / tool joint assembly is based on the average pipe length of 29.4 ft plus tool joint length.

** Including drill pipe volume.

PERFORATOR® Drill Pipe: Dimensions and Performance Properties

1	2	3	4	5	6	7	8	9	10	11	12	13			
Pipe Data															
Size: Outside Diameter D	Nominal Weight	Wall Thickness t	Inside Diameter d	Section Area Pipe Body A	Type Upset	Grade	Performance Properties								
							Pipe				Tool Joint				
							Collapse Resistance P _c	Internal Yield Pressure P _i	Tensile Yield	Torsional Yield	Tensile Yield	Torsional Yield			
in. mm	lb/ft kg/m	in. mm	sq.in. cm ²			psi bar	lb kN	ft-lb Nm	lb kN	ft-lb Nm					
5 1/2 139,7	19.20 28,57	0.304 7,72	4.892 124,26	4.9624 32,02	IEU	E	6 040 416	7 250 500	372 182 1 656	44 074 59 760	1 265 805 5 633	55 933 75 830			
							6 940 479	9 190 634	471 430 2 098	55 827 75 690	1 265 805 5 633	55 933 75 830			
							7 310 504	10 160 701	521 054 2 319	61 703 83 660	1 265 805 5 633	55 933 75 830			
							8 090 558	13 060 900	669 927 2 981	79 330 107 560	1 265 805 5 633	55 933 75 830			
5 1/2 139,7	21.90 32,59	0.361 9,17	4.778 121,36	5.8282 37,60	IEU	E	8 410 580	8 610 594	437 117 1 945	50 710 68 750	1 265 805 5 633	55 933 75 830			
											1 448 410 6 445	62 903 85 280			
											1 401 410 6 236	62 298 84 460			
							IEU	X	10 020 691	10 910 752	553 682 2 464	64 233 87 090	1 265 805 5 633	55 933 75 830	
													1 448 410 6 445	62 903 85 280	
													1 401 410 6 236	68 062 92 280	
							IEU	G	10 750 741	12 060 832	611 964 2 723	70 994 96 250	1 265 805 5 633	55 933 75 830	
													1 448 410 6 445	62 903 85 280	
													1 619 235 7 206	72 483 98 270	
													1 401 410 6 236	62 298 84 460	
									IEU	S	12 680 874	15 510 1 069	786 811 3 501	91 278 123 750	1 448 410 6 445
													1 619 235 7 206	62 903 85 280	
				1 401 410 6 236	62 298 84 460										
				1 925 541 8 569	87 170 118 190										

PERFORATOR® Drill Pipe: Dimensions and Performance Properties

	14	15	16	17	18	19	20	21	22	23	24	25	26
Tool Joint Data									Drill Pipe Data				
Connection Type	Diameter of Pin and Box			Tong Space Length of		Cross Sectional Area of		Adjusted Weight*	Make-Up Torque	Torsional Ratio, Pin to Pipe	Capacity	Total Displacement**	
	Outside	Inside	Elevator Upset	Pin	Box	Pin	Box						
	W	d _{iu}	DE	LPB	LB	AP	AB						
	in. mm					sq.in. cm ²		lb/ft kg/m	ft-lb Nm	US gal./ft l/m			
5 1/2 FH	7 177,8	4 101,6	5 11/16 144,5	8 203,2	10 254,0	10.371 66,91	11.670 75,29	21.61 32,2	27 966 37 920	1.27	0.946 11,75	1.277 15,86	
5 1/2 FH	7 177,8	4 101,6	5 11/16 144,5	8 203,2	10 254,0	10.371 66,91	11.670 75,29	21.61 32,2	27 966 37 920	1.00	0.946 11,75	1.277 15,86	
5 1/2 FH	7 177,8	4 101,6	5 11/16 144,5	8 203,2	10 254,0	10.371 66,91	11.670 75,29	21.61 32,2	27 966 37 920	0.91	0.946 11,75	1.277 15,86	
5 1/2 FH	7 177,8	4 101,6	5 11/16 144,5	8 203,2	10 254,0	10.371 66,91	11.670 75,29	21.61 32,2	27 966 37 920	0.71	0.946 11,75	1.277 15,86	
5 1/2 FH	7 177,8	4 101,6	5 11/16 144,5	8 203,2	10 254,0	10.371 66,91	11.670 75,29	24.28 36,1	27 966 37 920	1.10	0.906 11,254	1.277 15,862	
5 1/2 FH	7 177,8	3 3/4 95,3	5 11/16 144,5	8 203,2	10 254,0	11.893 76,73	11.670 75,29	24.73 36,8	31 452 42 640	1.24	0.899 11,17	1.277 15,86	
5 1/2 FH	7 3/8 187,3	4 11/16 119,1	6 9/64 156,0	8 203,2	10 254,0	11.480 74,06	10.646 68,68	23.94 35,6	31 149 42 230	1.23	0.929 11,54	1.295 16,09	
5 1/2 FH	7 177,8	4 101,6	5 11/16 144,5	8 203,2	10 254,0	10.371 66,91	11.670 75,29	24.28 36,1	27 966 37 920	0.87	0.906 11,25	1.277 15,86	
5 1/2 FH	7 177,8	3 3/4 95,3	5 11/16 144,5	8 203,2	10 254,0	11.893 76,73	11.670 75,29	24.73 36,8	31 452 42 640	0.98	0.899 11,17	1.277 15,86	
5 1/2 IF	7 3/8 187,3	4 11/16 119,1	6 9/64 156,0	8 203,2	10 254,0	11.480 74,06	10.646 68,68	23.94 35,6	34 031 46 140	1.06	0.929 11,54	1.295 16,09	
5 1/2 FH	7 177,8	4 101,6	5 11/16 144,5	8 203,2	10 254,0	10.371 66,91	11.670 75,29	24.28 36,1	27 966 37 920	0.79	0.906 11,25	1.277 15,86	
5 1/2 FH	7 177,8	3 3/4 95,3	5 11/16 144,5	8 203,2	10 254,0	11.893 76,73	11.670 75,29	24.73 36,8	31 452 42 640	0.89	0.899 11,17	1.277 15,86	
5 1/2 FH	7 1/4 184,2	3 1/2 88,9	5 11/16 144,5	8 203,2	10 254,0	13.316 85,91	14.468 93,34	25.70 38,2	36 241 49 140	1.02	0.892 11,08	1.285 15,96	
5 1/2 IF	7 3/8 187,3	4 11/16 119,1	6 9/64 156,0	8 203,2	10 254,0	11.480 74,06	10.646 68,68	23.94 35,6	31 149 42 230	0.88	0.929 11,54	1.295 16,09	
5 1/2 FH	7 177,8	3 3/4 95,3	5 11/16 144,5	8 203,2	10 254,0	11.893 76,73	11.670 75,29	24.73 36,8	31 452 42 640	0.69	0.899 11,17	1.277 15,86	
5 1/2 FH	7 177,8	3 1/2 88,9	5 11/16 144,5	8 203,2	10 254,0	13.316 85,91	11.670 75,29	25.17 37,5	31 452 42 640	0.69	0.892 11,08	1.277 15,86	
5 1/2 IF	7 3/8 187,3	4 11/16 119,1	6 9/64 156,0	8 203,2	10 254,0	11.480 74,06	10.646 68,68	23.94 35,6	31 149 42 230	0.68	0.929 11,54	1.295 16,09	
5 1/2 FH	7 1/2 190,5	3 76,2	5 11/16 144,5	8 203,2	10 254,0	15.869 102,38	17.365 112,03	27.01 40,2	43 585 59 090	0.95	0.881 10,94	1.293 16,06	

* Weight of the pipe / tool joint assembly is based on the average pipe length of 29.4 ft plus tool joint length.

** Including drill pipe volume.

PERFORATOR® Drill Pipe: Dimensions and Performance Properties

1	2	3	4	5	6	7	8	9	10	11	12	13						
Pipe Data																		
Size: Outside Diameter	Nominal Weight	Wall Thickness	Inside Diameter	Section Area Pipe Body	Type Upset	Grade	Performance Properties											
							Pipe				Tool Joint							
							Collapse Resistance	Internal Yield Pressure	Tensile Yield	Torsional Yield	Tensile Yield	Torsional Yield						
D		t	d	A			P _c	P _i										
in. mm	lb/ft kg/m	in. mm	sq.in. cm ²				psi bar	lb kN	ft-lb Nm	lb kN	ft-lb Nm							
5 1/2 139,7	24.70 36,76	0.415 10,54	4.670 118,62	6.6296 42,77	IEU	E	10 460 721	9 900 683	497 223 2 213	56 574 76 700	1 265 805	55 933						
											5 633	75 830						
											1 510 384	62 298						
											6 721	84 460						
											IEU	X	12 930	12 540	629 816	71 661	1 265 805	55 933
											892	865	2 803	97 160	5 633	75 830		
					1 448 410	62 903												
					6 445	85 280												
					1 265 805	56 452												
					5 633	76 540												
					1 448 410	64 734												
					6 445	87 770												
					1 619 235	72 483												
					7 206	98 270												
					1 510 384	62 298												
					6 721	84 460												
IEU	G	14 010	13 860	696 112	79 204	1 448 410	62 903											
966	956	3 098	107 380	6 445	85 280													
1 619 235	62 903																	
7 206	85 280																	
1 448 410	64 734																	
6 445	87 770																	
1 619 235	72 483																	
7 206	98 270																	
1 510 384	62 298																	
6 721	84 460																	
IEU	S	17 020	17 830	895 001	101 833	1 619 235	62 903											
1 174	1 229	3 983	138 070	7 206	85 280													
1 778 278	62 903																	
7 913	85 280																	
1 619 235	72 483																	
7 206	98 270																	
1 778 278	78 716																	
7 913	106 720																	
1 510 384	62 298																	
6 721	84 460																	
1 925 541	87 170																	
8 569	118 190																	

PERFORATOR® Drill Pipe: Dimensions and Performance Properties

	14	15	16	17	18	19	20	21	22	23	24	25	26
Tool Joint Data									Drill Pipe Data				
Connection Type	Diameter of Pin and Box			Tong Space Length of		Cross Sectional Area of		Adjusted Weight*	Make-Up Torque	Torsional Ratio, Pin to Pipe	Capacity	Total Displacement**	
	Outside	Inside	Elevator Upset	Pin	Box	Pin	Box						
	W	d _{iu}	DE	LPB	LB	AP	AB						
	in. mm					sq.in. cm ²		lb/ft kg/m	ft-lb Nm		US gal./ft l/m		
5 1/2 FH	7 177,8	4 101,6	5 11/16 144,5	8 203,2	10 254,0	10.371 66,91	11.670 75,29	26.74 39,8	27 966 37 920	0.99	0.868 10,782	1.277 15,862	
5 1/2 IF	7 3/8 187,3	4 9/16 115,9	6 9/64 156,0	8 203,2	10 254,0	12.389 79,93	10.646 68,68	26.68 39,7	31 149 42 230	1.10	0.887 11,02	1.295 16,09	
5 1/2 FH	7 177,8	4 101,6	5 11/16 144,5	8 203,2	10 254,0	10.371 66,91	11.670 75,29	26.74 39,8	27 966 37 920	0.78	0.868 10,78	1.277 15,86	
5 1/2 FH	7 177,8	3 3/4 95,3	5 11/16 144,5	8 203,2	10 254,0	11.893 76,73	11.670 75,29	27.20 40,5	31 452 42 640	0.88	0.861 10,69	1.277 15,86	
5 1/2 FH	7 1/4 184,2	4 101,6	5 11/16 144,5	8 203,2	10 254,0	10.371 66,91	14.468 93,34	27.27 40,6	28 226 38 270	0.79	0.868 10,78	1.285 15,96	
5 1/2 FH	7 1/4 184,2	3 3/4 95,3	5 11/16 144,5	8 203,2	10 254,0	11.893 76,73	14.468 93,34	27.73 41,3	32 367 43 880	0.90	0.861 10,69	1.285 15,96	
5 1/2 FH	7 1/4 184,2	3 1/2 88,9	5 11/16 144,5	8 203,2	10 254,0	13.316 85,91	14.468 93,34	28.16 41,9	36 241 49 140	1.01	0.854 10,61	1.285 15,96	
5 1/2 IF	7 3/8 187,3	4 9/16 115,9	6 9/64 156,0	8 203,2	10 254,0	12.389 79,93	10.646 68,68	26.68 39,7	31 149 42 230	0.87	0.887 11,02	1.295 16,09	
5 1/2 FH	7 177,8	3 3/4 95,3	5 11/16 144,5	8 203,2	10 254,0	11.893 76,73	11.670 75,29	27.20 40,5	31 452 42 640	0.79	0.861 10,69	1.277 15,86	
5 1/2 FH	7 177,8	3 1/2 88,9	5 11/16 144,5	8 203,2	10 254,0	13.316 85,91	11.670 75,29	27.63 41,1	31 452 42 640	0.79	0.854 10,61	1.277 15,86	
5 1/2 FH	7 1/4 184,2	3 3/4 95,3	5 11/16 144,5	8 203,2	10 254,0	11.893 76,73	14.468 93,34	27.73 41,3	32 367 43 880	0.82	0.861 10,69	1.285 15,96	
5 1/2 FH	7 1/4 184,2	3 1/2 88,9	5 11/16 144,5	8 203,2	10 254,0	13.316 85,91	14.468 93,34	28.16 41,9	36 241 49 140	0.92	0.854 10,61	1.285 15,96	
5 1/2 IF	7 3/8 187,3	4 9/16 115,9	6 9/64 156,0	8 203,2	10 254,0	12.389 79,93	10.646 68,68	26.68 39,7	31 149 42 230	0.79	0.887 11,02	1.295 16,09	
5 1/2 FH	7 177,8	3 1/2 88,9	5 11/16 144,5	8 203,2	10 254,0	13.316 85,91	11.670 75,29	27.63 41,1	31 452 42 640	0.62	0.854 10,61	1.277 15,86	
5 1/2 FH	7 177,8	3 1/4 82,6	5 11/16 144,5	8 203,2	10 254,0	14.642 94,46	11.670 75,29	28.02 41,7	31 452 42 640	0.62	0.848 10,53	1.277 15,86	
5 1/2 FH	7 1/4 184,2	3 1/2 88,9	5 11/16 144,5	8 203,2	10 254,0	13.316 85,91	14.468 93,34	28.16 41,9	36 241 49 140	0.71	0.854 10,61	1.285 15,96	
5 1/2 FH	7 1/4 184,2	3 1/4 82,6	5 11/16 144,5	8 203,2	10 254,0	14.642 94,46	14.468 93,34	28.55 42,5	39 358 53 360	0.77	0.854 10,61	1.285 15,96	
5 1/2 IF	7 3/8 187,3	4 9/16 115,9	6 9/64 156,0	8 203,2	10 254,0	12.389 79,93	10.646 68,68	26.68 39,7	31 149 42 230	0.61	0.887 11,02	1.295 16,09	
5 1/2 FH	7 1/2 190,5	3 76,2	5 11/16 144,5	8 203,2	10 254,0	15.869 102,38	17.365 112,03	29.47 43,9	43 585 59 090	0.86	0.843 10,47	1.293 16,06	

* Weight of the pipe / tool joint assembly is based on the average pipe length of 29.4 ft plus tool joint length.

** Including drill pipe volume.

PERFORATOR® Drill Pipe: Dimensions and Performance Properties

1	2	3	4	5	6	7	8	9	10	11	12	13	
Pipe Data													
Size: Outside Diameter D	Nominal Weight	Wall Thickness t	Inside Diameter d	Section Area Pipe Body A	Type Upset	Grade	Performance Properties						
							Pipe				Tool Joint		
							Collapse Resistance P _c	Internal Yield Pressure P _i	Tensile Yield	Torsional Yield	Tensile Yield	Torsional Yield	
in. mm	lb/ft kg/m	in. mm	sq.in. cm ²			psi bar	lb kN	ft-lb Nm	lb kN	ft-lb Nm			
6 152,4	22.00 32,74	0.324 8,23	5.350 135,89	5.0019 32,27	IEU	E	5 750 396	7 090 489	433 011 1 927	56 119 76 090	1 289 490 5 738	61 742 83 710	
							6 560 452	8 980 619	548 860 2 442	71 084 96 380	1 289 490 5 738	61 742 83 710	
							6 890 475	9 920 684	606 635 2 700	78 567 106 520	1 289 490 5 738	61 742 83 710	
							7 530 519	12 750 879	779 959 3 471	101 014 136 950	1 289 490 5 738	61 742 83 710	
6 152,4	25.00 37,21	0.380 9,65	5.240 133,10	6.7084 43,28	IEU	E	7 880 543	8 310 573	503 190 2 239	63 973 86 730	1 289 490 5 738	61 742 83 710	
							9 330 643	10 530 726	637 374 2 836	81 033 109 860	1 289 490 5 738	61 742 83 710	
							9 990 689	11 640 803	704 466 3 135	89 563 121 430	1 289 490 5 738	61 742 83 710	
							11 660 804	14 960 1 031	905 742 4 031	115 152 156 120	1 401 410 6 236	62 298 84 460	
6 5/8 168,3	25.20 37,50	0.330 8,38	5.965 151,51	6.5262 42,10	IEU	E	4 790 330	6 540 451	489 465 2 178	70 580 95 690	1 448 419 6 445	73 661 99 870	
							5 320 367	8 280 571	619 989 2 759	89 402 121 210	1 448 419 6 445	73 661 99 870	
							5 500 379	9 150 631	685 251 3 049	98 812 133 970	1 448 419 6 445	73 661 99 870	
							6 040 416	11 770 812	881 037 3 921	127 045 172 250	1 448 419 6 445	73 661 99 870	
6 5/8 168,3	27.30 40,63	0.362 9,19	5.901 149,89	7.1226 45,95	IEU	E	5 890 406	7 170 494	534 199 2 377	76 295 103 440	1 448 419 6 445	73 661 99 870	
							6 750 465	9 080 626	676 652 3 011	96 640 131 020	1 448 419 6 445	73 661 99 870	
							7 100 490	10 040 692	747 879 3 328	106 813 144 820	1 448 419 6 445	73 661 99 870	
							7 810 538	12 910 890	961 558 4 279	137 331 186 190	1 448 419 6 445	73 661 99 870	

PERFORATOR® Drill Pipe: Dimensions and Performance Properties

	14	15	16	17	18	19	20	21	22	23	24	25	26
Tool Joint Data									Drill Pipe Data				
Connection Type	Diameter of Pin and Box			Tong Space Length of		Cross Sectional Area of		Adjusted Weight*	Make-Up Torque	Torsional Ratio, Pin to Pipe	Capacity	Total Displacement**	
	Outside	Inside	Elevator Upset	Pin	Box	Pin	Box						
	W	d _{iu}	DE	LPB	LB	AP	AB						
	in. mm					sq.in. cm ²		lb/ft kg/m	ft-lb Nm		US gal./ft l/m		
5 1/2 IF	7 3/8 187,3	4 13/16 122,2	6 9/64 156,0	8 203,2	10 254,0	10.548 68,05	10.646 68,68	23.69 35,3	30 871 41 850	1.10	1.148 14,259	1.510 18,756	
5 1/2 IF	7 3/8 187,3	4 13/16 122,2	6 9/64 156,0	8 203,2	10 254,0	10.548 68,05	10.646 68,68	23.69 35,3	30 871 41 850	0.87	1.148 14,26	1.510 18,76	
5 1/2 IF	7 3/8 187,3	4 13/16 122,2	6 9/64 156,0	8 203,2	10 254,0	10.548 68,05	10.646 68,68	23.69 35,3	30 871 41 850	0.79	1.148 14,26	1.510 18,76	
5 1/2 IF	7 3/8 187,3	4 13/16 122,2	6 9/64 156,0	8 203,2	10 254,0	10.548 68,05	10.646 68,68	23.69 35,3	30 871 41 850	0.61	1.148 14,26	1.510 18,76	
5 1/2 IF	7 3/8 187,3	4 13/16 122,2	6 9/64 156,0	8 203,2	10 254,0	10.548 68,05	10.646 68,68	26.55 39,5	30 871 41 850	0.97	1.104 13,713	1.510 18,756	
5 1/2 IF	7 3/8 187,3	4 13/16 122,2	6 9/64 156,0	8 203,2	10 254,0	10.548 68,05	10.646 68,68	26.55 39,5	30 871 41 850	0.76	1.104 13,71	1.510 18,76	
5 1/2 IF	7 3/8 187,3	4 13/16 122,2	6 9/64 156,0	8 203,2	10 254,0	10.548 68,05	10.646 68,68	26.55 39,5	30 871 41 850	0.69	1.104 13,71	1.510 18,76	
5 1/2 IF	7 3/8 187,3	4 11/16 119,1	6 9/64 156,0	8 203,2	10 254,0	11.480 74,06	10.646 68,68	26.84 39,9	31 149 42 230	0.54	1.100 13,66	1.510 18,76	
6 5/8 FH	8 203,2	5 127,0	6 3/4 171,5	8 203,2	10 254,0	11.863 76,54	14.162 91,37	27.89 41,5	36 830 49 930	1.04	1.412 17,539	1.838 22,830	
6 5/8 FH	8 203,2	5 127,0	6 3/4 171,5	8 203,2	10 254,0	11.863 76,54	14.162 91,37	27.89 41,5	36 830 49 930	0.82	1.412 17,54	1.838 22,83	
6 5/8 FH	8 203,2	5 127,0	6 3/4 171,5	8 203,2	10 254,0	11.863 76,54	14.162 91,37	27.89 41,5	36 830 49 930	0.75	1.412 17,54	1.838 22,83	
6 5/8 FH	8 203,2	5 127,0	6 3/4 171,5	8 203,2	10 254,0	11.863 76,54	14.162 91,37	27.89 41,5	36 830 49 930	0.58	1.412 17,54	1.838 22,83	
6 5/8 FH	8 203,2	5 127,0	6 3/4 171,5	8 203,2	10 254,0	11.863 76,54	14.162 91,37	29.72 44,2	36 830 49 930	0.97	1.384 17,191	1.838 22,830	
6 5/8 FH	8 203,2	5 127,0	6 3/4 171,5	8 203,2	10 254,0	11.863 76,54	14.162 91,37	29.72 44,2	36 830 49 930	0.76	1.384 17,19	1.838 22,83	
6 5/8 FH	8 203,2	5 127,0	6 3/4 171,5	8 203,2	10 254,0	11.863 76,54	14.162 91,37	29.72 44,2	36 830 49 930	0.69	1.384 17,19	1.838 22,83	
6 5/8 FH	8 203,2	5 127,0	6 3/4 171,5	8 203,2	10 254,0	11.863 76,54	14.162 91,37	29.72 44,2	36 830 49 930	0.54	1.384 17,19	1.838 22,83	

* Weight of the pipe / tool joint assembly is based on the average pipe length of 29.4 ft plus tool joint length. ** Including drill pipe volume.

Standard Practice for Marking Tool Joints and Drill Pipe

Drill Pipe Marking

The following marks are applied as standard to the drill pipe body.
Paint stenciling on Pipe Body

Example

TPS Manufacturer's Symbol	Spec. 5 D Specification	5 / 99 Date of Manufacture
3 1/2" x 15.50 lb/ft Size x Weight	S 135 Grade	x y Heat Number or Heat Code

Tool Joint Marking

The following marks are applied as standard to the tool joints.
Die stamping on Pin and Box End



Example

253 Serial Number	SK Manufacturer's Symbol	VPI 23.03 Part Number
3/99 Date of Manufacture	NC 38 (3 1/2" IF) Connection	x y Heat Number or Heat Code

Other Marking can be performed on request.

Internal Coating of Drill Pipe

WE OFFER TOGETHER WITH TUBOSCOPE VETCO INTERNALLY COATED DRILL PIPE

FOR CORROSION PROTECTION AND IMPROVED HYDRAULIC EFFICIENCY OF DRILL PIPE.

Internally coated drill pipe have been increasingly used for more than three decades. As a passive corrosion protection, the coating acts as a barrier to avoid direct contact between the steel pipe and the corrosive medium (fluid/gases etc.), thus avoiding corrosion.

- **Drilling:**

The drilling fluids used today can be classified from 'non corrosive' up to 'extremely corrosive'.

Since within the lifetime of a drill string, the utilization will be for all different environments, corrosion caused by aggressive muds has to be considered.

- **Testing and Stimulation:**

Downhole tests as well as stimulation services very often initiate extremely corrosive environments. Especially CO_2 and H_2S influence the corrosion rate. Acids used for stimulation purposes in connection with high bottomhole temperatures lead to high corrosion rates although stimulation periods are relatively short.

- **Storage of Drill Pipe:**

Practically all drill pipe remain in storage for shorter resp. longer periods. This can happen directly at the rig site or at the pipe yard. During this time the uncoated internal drill pipe surface is very often subject to so called rack corrosion. Left drilling fluid, oxygen and condensates generate a corrosive environment, which attacks the internal surface of drill pipe.

Advantage of Internal Coating

Advantage of Internal Coatings

• Corrosion Protection

Primarily corrosion within drill pipe starts as a type of pitting corrosion. Due to cyclical stresses encountered in drilling, any given section of the drill pipe in operation is permanently under tensile stress (weight of the string), internal respectively external pressure (mud system) and under alternate compressive and tensile stresses due to the deviation of the hole being drilled. The corrosion pittings develop into transverse cracks (notch effect). This phenomenon which is called "stress corrosion cracking" develops perpendicular to the main stress direction. Although the transverse cracks inside a drill pipe generally develop over the entire length, a certain preference for the end areas has been found in practice due to the change in cross sectional areas. Wash outs and/or ruptures predominantly occurring up to one meter behind the upsets are known in the drilling industry.

With today's application of internally coated drill pipe the internal corrosion can be controlled. Without internal corrosion no notch effect can occur.

Stress corrosion cracking with all its consequences such as wash-outs and/or pipe ruptures does not represent a problem anymore if internally coated drill pipe is used by drilling companies. Even wireline cuts which may develop after some time in service - especially within the tool joint and upset areas - do not limit the positive performance of internal coatings.

• Hydraulic Efficiency

One major advantage of internally coated drill pipe is found in the improved hydraulic efficiency. Due to the very smooth (glossy) internal surface of the drill pipe, the pressure drop can be reduced considerably inside the drill string. This results in either energy savings during drilling or (more probably) in a higher drilling speed since a higher pressure is available at the bit.

- Energy savings of > 9 % and better
- Circulation rates > 14 % can be achieved

An additional positive effect is the reduction in deposit build-up achieved by the glossy and smooth internal surface. Moreover, the cleaning of internally coated pipe is much easier and more efficient.

CERTIFICATE OF ACHIEVEMENT
 AWARDED TO
PERFORATOR GmbH
 Plant Facility Unit
 Walkenried, Germany

AS A
CERTIFIED ARNCO 100XT™ HARDBANDER

FOR DEMONSTRATING THE ABILITY TO APPLY ARNCO 100XT™ HARDBANDING
 ACCORDING TO THE RECOMMENDED PROCEDURES MANUAL VERSION 1.2, August 25, 2001

Larry S. Jones
 Larry S. Jones
 Arnco Technology Trust, Ltd.

December 17, 2002
 Date

CERTIFICATE OF ACHIEVEMENT
 AWARDED TO
PERFORATOR GmbH
 Plant Facility Unit
 Walkenried, Germany

AS A
CERTIFIED ARNCO 300XT™ HARDBANDER

FOR DEMONSTRATING THE ABILITY TO APPLY ARNCO 300XT™ HARDBANDING
 ACCORDING TO THE RECOMMENDED PROCEDURES MANUAL VERSION 1.1, April 25, 2003

Larry S. Jones
 Larry S. Jones
 Arnco Technology Trust, Ltd.

November 14, 2003
 Date

CERTIFICATE OF ACHIEVEMENT
 AWARDED TO
PERFORATOR GmbH
 Plant Facility Unit
 Walkenried, Germany

AS A
CERTIFIED ARNCO 200XT™ HARDBANDER

FOR DEMONSTRATING THE ABILITY TO APPLY ARNCO 200XT™ HARDBANDING
 ACCORDING TO THE RECOMMENDED PROCEDURES MANUAL VERSION 3.0, October, 1999

Larry S. Jones
 Larry S. Jones
 Arnco Technology Trust, Ltd.

November 14, 2003
 Date

Certificate of Authority to Use the Official API Monogram
 License Number: SD-0012

The American Petroleum Institute hereby grants to
TPS-TECHNITUBE RÖHRENWERKE GMBH
 Duss, Germany

the right to use the Official API Monogram™ for manufactured products under the conditions in the official publications of the American Petroleum Institute, including API Spec Q1™ and API Spec 5L.

It is a condition of this license that the licensee shall comply with the requirements of the License Agreement.

Effective Date: APRIL 2, 2001
 Expiration Date: APRIL 2, 2005

J. Williams
 Director of the Monogram Program

Certificate of Authority
 License Number: 7-0051

The American Petroleum Institute hereby grants to
PERFORATOR GMBH
 Bei dem Gerichte
 Walkenried, Germany

the right to use the Official API Monogram™ for manufactured products under the conditions in the official publications of the American Petroleum Institute, including API Spec Q1™ and API Spec 7.

It is a condition of this license that the licensee shall comply with the requirements of the License Agreement.

Effective Date: DECEMBER 11, 2002
 Expiration Date: SEPTEMBER 29, 2005

J. Williams
 Director of the Monogram Program

TÜV CERT
CERTIFICATE

The TÜV CERT Certification Body
 of TÜV Thüringen e.V.
 certifies in accordance with TÜV CERT
 procedure that

PERFORATOR GmbH
 ein Unternehmen der Schmidt, Kranz - Gruppe
 37445 Walkenried / Germany

has established and applies a quality management system for

Development, manufacturing and service of
 pressing drill technology, drill pipes and general
 equipment for the mining industry

An audit was performed. Report No. 3330 20WG D0
 Proof has been furnished that the requirements according to
 EN ISO 9001:2000
 are fulfilled. The certificate is valid until 2006-11-09
 Certificate Registration No. 15 100 4009

TÜV THÜRINGEN
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