

1 - SCOPE OF APPLICATION

For some applications, some customer or end users need specific VAM connections,

These connections require special make-up torque values, different from standard VAM tables or a torque not existing in VAM tables.



Special make-up torques

Size O.D in. mm	Nominal Weight lb/ft	Wall Thickness in. mm	Grade 80Ksi			Grade 95Ksi			Grade 110Ksi			Grade 125Ksi			Drawing	Customer
			Min.	Opti.	Max.	Min.	Opti.	Max.	Min.	Opti.	Max.	Min.	Opti.	Max.		
2 1/16	3.25	0.156	810	900	990										M2100NVAM N2100NVR	UNOCAL
		3.96	1110	1230	1350											
		0.225	1080	1190	1300											
4	4.50	5.72	1460	1620	1780										ST-D 4207/A	SCHLUMBERGER
		0.285	2740	3040	3340				3390	3760	4130					
		7.25	3710	4120	4530				4600	5100	5600					
6 5/8	11.60	0.290	4010	4450	4900	4630	5140	5650	5240	5820	6400	5860	6510	7160	SI_PD-100647	ARAMCO
		7.26	5430	6030	6630	6270	6970	7670	7100	7890	8680	7950	8830	9710		
		0.551	10450	11550	12650	11100	12300	13500	11700	13000	14300	12450	13750	15050		
7	37.40	14.00	14100	15700	17300	15000	16700	18400	15900	17700	19500	16700	18600	20500	ST-D 4018/A	VOLGANEFTJ Russia
		0.571	10850	11950	13050	11450	12650	13850	12100	13400	14700	12700	14100	15500		
		14.50	14600	16200	17800	15500	17200	18900	16300	18100	19900	17200	19100	21000		
13 3/8	88.20	0.670				11100	12300	13500							ST-D 4009/A	SHELL Expro
		17.02				15000	16700	18400								
		0.625	14400	15900	17400	14400	15900	17400	14400	15900	17400	14400	15900	17400		
16	84.00	15.88	19400	21600	23800	19400	21600	23800	19400	21600	23800	19400	21600	23800	ST-D 4019/A	CONOCO
		0.495	20850	23150	25450	20850	23150	25450	20850	23150	25450	20850	23150	25450		
		12.57	28300	31400	34500	28300	31400	34500	28300	31400	34500	28300	31400	34500		
13 3/8	109.00	0.656	20850	23150	25450	20850	23150	25450	20850	23150	25450	20850	23150	25450	ST-D 4015/C	MOBIL MJC Viet-Nam
		16.66	28300	31400	34500	28300	31400	34500	28300	31400	34500	28300	31400	34500		

Special make-up torques



Size O.D in.	Nominal Weight lb/ft	Wall Thickness in. mm	Grade 80 Ksi			Grade 85ksi			Grade 110ksi			Grade 130 ksi			Drawing	Customer	
			Min.	Opti. ft.lb	Max.	Min.	Opti. ft.lb	Max.	Min.	Opti. ft.lb	Max.	Min.	Opti. ft.lb	Max.			
3 1/2	8.19	0.235 5.97										3130 4240	3470 4710	3810 5180	ST-D 4409 /A	CHEVRON	
3 1/2	9.20	0.254 6.45							2570 3460	2850 3850	3140 4240				ST-D 4413 /B	AGIP	
3 1/2	10.65	0.313 7.95										4370 5900	4850 6600	5330 7300	ST-D 4402 /C	CHEVRON	
4	11.60	0.286 7.26	Grade 35 Ksi :			2340 3180	2600 3530	2860 3880							ST-D 2009 /D	MONSANTO	
4	13.20	0.330 8.38				See last page for values										ST-D 4405 /C	SHELL and SUBSID. except SHELL OIL
4	13.20	0.330 8.38				Please call VAM Services										ST-D 4411 /A	EXXON
4	22.50	0.610 15.49	9800 13200	10500 14200	11200 15200										ST-D 4400 /A	HUNT	
4 1/2	13.50	0.290 7.37				4820 6500	5240 7100	5660 7700							ST-D 2012 /D	EXXON-MOBIL (Hoover Project)	
13 3/8	103.40	0.750 19.05	20850 28300	23150 31400	25450 34500										ST-D 4376 /B	CAL ENERGY	
																VAM ACE-NA	

Special make-up torques

VAM *ACE* **MOD**

Size O.D in.	Nominal Weight lb/ft	Wall Thickness in. mm	Grade 80Ksi		Grade 125 ksi		Opti. ft.lb Nm		Customer	
			Min.	Max.	Min.	Max.	Opti.	Max.		
4 1/2	11.60	0.250 6.35	Please call VAM Services						TX04401164	BHHP Australia
4 1/2	13.50	0.290 7.37	See last page for values						ST-D 4407/ C	SHELL UK
4 1/2	18.90	0.430 10.92	See last page for values						ST-D 4408/ C	SHELL UK
5 1/2	15.50	0.275 6.99	Please call VAM Services						ST-D 4373 /B	STATOIL
7	17.00	0.304 7.72	6880	7650	8420				ST-D 4373 /B	VAM ACE MOD
	20.00	0.361 9.17	8750	9700	10650				ST-D 4373 /B	SAGA Norway
	26.00	0.362 9.19	10100	11200	12300				ST-D 4374 /A	ESSO Australia
	29.00	0.408 10.36	12200	13550	14900				ST-D 4374 /A	BHP Petroleum & Woodside Australia
	32.00	0.453 11.51	13450	14950	16450				ST-D 4374 /A	SAGA Norway
			18300	20300	22300					VAM ACE MOD



Special make-up torques

Size O.D in.	Nominal Weight lb/ft	Wall Thickness in. mm	55 ksi			75-80-85 ksi			90-95-100 ksi			105-110-115 ksi			Customer
			Min.	Opti.	Max.	Min.	Opti.	Max.	Min.	Opti.	Max.	Min.	Opti.	Max.	
			ft.lb Nm			ft.lb Nm			ft.lb Nm			ft.lb Nm			
5 1/2	15.50	0.275 6.99				3650 4900	4050 5500	4450 6100							IMPERIAL OIL
	23.00	0.317 8.05	4880 6700	5420 7400	5960 8100	6510 8800	7230 9800	7950 10800	7830 10600	8700 11800	9570 13000	8780 11900	9750 13200	10720 14500	VAM SW-NA
	26.00	0.362 9.19	6250 8500	6940 9400	7630 10300	8460 11400	9400 12700	10340 14000	10100 13700	11200 15200	12300 16700	11450 15500	12650 17200	13850 18900	
8 5/8	29.00	0.408 10.36	7830 10600	8700 11800	9570 13000	10450 14100	11550 15700	12650 17300	12100 16300	13400 18100	14700 19900	14050 19000	15550 21100	17050 23200	
	32.00	0.352 8.94	9850 13200	10850 14700	11850 16200	15050 20300	16650 22600	18250 24900	15050 20300	16650 22600	18250 24900	17000 22900	18800 25500	20600 28100	SHELL CANADA
	36.00	0.400 10.16	11000 15000	12300 16700	13500 18400	15050 20300	16650 22600	18250 24900	17000 22900	18800 25500	20600 28100	18900 25600	21000 28400	23100 31200	IMPERIAL OIL
9 5/8	43.50	0.435 11.05				17600 23900	19550 26500	21500 29200							VAM SW-I
	23.00	0.317 8.05	4880 6700	5420 7400	5960 8100	6510 8800	7230 9800	7950 10800	7830 10600	8700 11800	9570 13000	8750 11900	9750 13200	10720 14500	SUNCOR
13 3/8	26.00	0.362 9.19	6250 8500	6940 9400	7630 10300	8460 11400	9400 12700	10340 14000	10100 13700	11200 15200	12300 16700	11450 15500	12650 17200	13850 18900	
	29.00	0.408 10.36	7830 10600	8700 11800	9570 13000	10450 14100	11550 15700	12650 17300	12100 16300	13400 18100	14700 19900	14050 19000	15550 21100	17050 23200	

SM-SW

Special make-up torques

Size O.D in.	Nominal Weight lb/ft	Wall Thickness in. mm	55 ksi			75-80-85 ksi			90-95-100 ksi			105-110-115 ksi			Customer
			Min.	Opti.	Max.	Min.	Opti.	Max.	Min.	Opti.	Max.	Min.	Opti.	Max.	
			ft.lb Nm			ft.lb Nm			ft.lb Nm			ft.lb Nm			
7	26.00	0.362 9.19	5860 7900	6510 8800	7160 9700										VAM SM SW
	29.00	0.408 10.36	7160 9700	7950 10800	8740 11900										VAM SM SW
	33.70	0.430 10.92	7830 10600	8700 11800	9570 13000										VAM SM SW
9 5/8	40.00	0.395 10.03	7800 10600	8680 11800	9550 13000										VAM SM SW
	43.50	0.435 11.05	9850 13200	10850 14700	11850 16200										VAM SM SW
	47.00	0.472 11.99	11700 15900	13000 17700	14300 19500										VAM SM SW
	53.50	0.545 13.84	13050 17600	14450 19600	15850 21600										VAM SM SW
	58.40	0.595 15.11	14400 19400	15900 21600	17400 23800										VAM SM SW
	59.40	0.609 15.47	14400 19400	15900 21600	17400 23800										VAM SM SW

Special make-up torques



Size O.D. in.	Nominal Weight lb/ft	Wall Thickne in.	Grade 55 Ksi			Grade 80 Ksi			Grades 90-95Ksi			Grade 110 Ksi			Grade 125 Ksi			Drawing	Customer
			Min.	Opti.	Max.	Min.	Opti.	Max.	Min.	Opti.	Max.	Min.	Opti.	Max.	Min.	Opti.	Max.		
			ft.lb	Nm		ft.lb	Nm		ft.lb	Nm		ft.lb	Nm		ft.lb	Nm			
4 1/2	18.90	0.380				6390	7090	7790	7170	7960	8750	7830	8700	9570	8780	9750	10720	ST-D 4718/A	EXXON
		9.65				8600	9600	10600	9700	10800	11900	10600	11800	13000	11900	13200	14500		VAM FJL-NA
6 5/8	23.20	0.330				4230	4700	5170	4880	5420	5960	5540	6150	6760	6190	6870	7550	ST-D 4726/A	
		8.38				5800	6400	7000	6700	7400	8100	7500	8300	9100	8400	9300	10200		VAM FJL-NA
7	23.00	0.317				4500	4990	5480	5220	5790	6360	5860	6510	7160	6510	7230	7950	ST-D 4721/A	
		8.05				6100	6800	7500	7000	7800	8600	7900	8800	9700	8800	9800	10800		VAM FJL-NA
7	26.00	0.362				5080	5640	6200	5800	6440	7080	6510	7230	7950	7470	8300	9130	ST-D 4722/A	
		9.19				6800	7600	8400	7800	8700	9600	8800	9800	10800	10200	11300	12400		VAM FJL-NB
7 5/8	26.40	0.328	4040	4480	4940	5480	6080	6680	6320	7020	7720	7170	7960	8750	8150	9050	9950	ST-D 4724/A	
		8.33	5480	6090	6700	7400	8200	9000	8500	9500	10500	9700	10800	11900	11100	12300	13500		VAM FJL-NF
7 5/8	29.70	0.375				6120	6800	7480	7170	7960	8750	8150	9050	9950	8780	9750	10720	ST-D 4725/A	
		9.53				8300	9200	10100	9700	10800	11900	11100	12300	13500	11900	13200	14500		VAM FJL-NG
7 5/8	51.20	0.687													12450	13750	15050	ST-D 4711/A	ELF Enterprise caledonian
		17.45													16700	18600	20500		VAM FJL-L
7 3/4	46.10	0.595				8780	9750	10720	9850	10850	11850	10850	11850	13050	11700	13000	14300	ST-D4717/A	US market
		15.11				11900	13200	14500	13200	14700	16200	14600	16200	17800	15900	17700	19500		VAM FJL-NE
8 1/8	42.00	0.500				10400	11600	12800	12100	13400	14700	13700	15200	16700	14300	15900	17500	SI_PD-100558	Petro China Sichuan
		12.70				14100	15700	17300	16400	18200	20000	18500	20600	22700	19400	21600	23800		VAM FJL-NA
	43.00	0.514				10700	11900	13100	12300	13700	15100	13700	15200	16700	14300	15900	17500		
		13.06				14600	16200	17800	16700	18600	20500	18500	20600	22700	19400	21600	23800		
8 5/8	32.00	0.352	5220	5790	6360	7170	7960	8750	8150	9050	9950	9500	10500	11500	10850	11850	13050	ST-D 4716/C	SPIRIT ENERGY
		8.94	7000	7800	8600	9700	10800	11900	11100	12300	13500	12800	14200	15600	14600	16200	17800		VAM FJL-NA
	36.00	0.400	5580	6200	6820	7470	8300	9130	8460	9400	10340	9850	10850	11850	11100	12300	13500		
		10.16	7600	8400	9200	10200	11300	12400	11400	12700	14000	13200	14700	16200	15000	16700	18400		
8 5/8	49.00	0.557				9150	10150	11150	10450	11550	12650	11700	13000	14300	13050	14450	15850	ST-D 4712/A	BPS RED HILLS
		14.15				12300	13700	15100	14100	15700	17300	15900	17700	19500	17600	19600	21600		
9 5/8	36.00	0.352				9150	10150	11150	10850	11850	13050	12450	13750	15050	13700	15200	16700	ST-D 4719/B	SPIRIT ENERGY
		8.94				12300	13700	15100	14600	16200	17800	16700	18600	20500	18500	20600	22700		VAM FJL-NA
	40.00	0.395				9500	10500	11500	10850	11950	13050	12450	13750	15050	14050	15550	17050		
		10.03				12800	14200	15600	14600	16200	17800	16700	18600	20500	19000	21100	23200		
	43.50	0.435				9500	10500	11500	11100	12300	13500	12450	13750	15050	14050	15550	17050		
		11.05				12800	14200	15600	15000	16700	18400	16700	18600	20500	19000	21100	23200		
10 3/4	45.50	0.400	8800	9760	10700	12100	13400	14700	14300	15900	17500	16300	18100	19900	18300	20300	22300	SI_PD-100520	APACHE
		10.16	11900	13200	14500	16300	18100	19900	19400	21600	23800	22000	24500	26900	24700	27500	30300		VAM FJL-ND
10 3/4	40.50	0.350				11100	12300	13500	12700	14100	15500	14650	16250	17850	16650	18450	20250	ST-D 4727/A	
		8.89				15000	16700	18400	17200	19100	21000	19900	22100	24300	22500	25000	27500		VAM FJL-NA
10 3/4	45.50	0.400	12100	13400	14700	14400	15900	17400	16300	18100	19900	18250	20250	22250	18250	20250	22250	ST-D 4728/A	
		10.16	16300	18100	19900	19400	21600	23800	22000	24500	27000	24700	27500	30300	24700	27500	30300		VAM FJL-NB
	51.00	0.450	12450	13750	15050	14400	15900	17400	16300	18100	19900	18250	20250	22250	18250	20250	22250		
		11.43	16700	18600	20500	19400	21600	23800	22000	24500	27000	24700	27500	30300	24700	27500	30300		
13 3/8	80.70	0.580										13050	14450	15850				ST-D 4729/B	SPECIAL TITANIUM
		14.73										17600	19600	21600					VAM FJL-NA



Special make-up torques

Size O.D. in.	Nominal Weight lb/ft	Wall Thickness in. mm	Grade 80 Ksi		Grades 90-95Ksi		Grade 110 Ksi		Grade 125 Ksi		Drawing	Customer
			Min.	Opti.	Max.	Min.	Opti.	Max.	Min.	Opti.		
4 1/2	16.90	0.380 9.65							5400	6000	6600	MOBIL
5	18.00	0.362 9.19	3650	4050	4450	4040	4480	4920	4430	4920	5410	MOBIL
6 5/8	28.00	0.417 10.59	10700	11800	12900				6000	6700	7400	SHELL UK
6 5/8	47.10	0.750 19.05	14400	16000	17600				11450	12650	13850	VAM SL2S
7 5/8	52.80	0.712 18.08							15500	17200	18900	PHILLIPS
7 5/8	55.30	0.750 19.05				16300	18100	19900	17650	19550	21450	ELF Elgin Franklin
8 5/8	44.00	0.500 12.70				22000	24500	27000	23800	26500	29200	SHELL UK
10 3/4	65.70	0.595 15.11				20850	23150	25450	13250	14650	16050	PHILLIPS
10 3/4	85.30	0.797 20.24	21700	23500	25300				17900	19900	21900	PHILLIPS
			29500	31900	34300				20850	23150	25450	PHILLIPS
									28300	31400	34500	MAGMA POWER

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Special make-up torques

Size O.D. in.	Nominal Weight lb/ft	Wall Thickness in. mm	Grade 80 Ksi		Grades 90-95-100Ksi		Grade 110 Ksi		Grade 125 Ksi		Drawing	Customer
			Min.	Opti.	Max.	Min.	Opti.	Max.	Min.	Opti.		
7		0.937 23.80							19600	21700	23800	PHILLIPS
									26500	29400	32300	



Special make-up torques

Size O.D. in.	Nominal Weight lb/ft	Wall Thickness in. mm	Grade 80 Ksi		Grades 90-95Ksi		Grade 110 Ksi		Grade 125 Ksi		Drawing	Customer
			Min.	Opti.	Max.	Min.	Opti.	Max.	Min.	Opti.		
6 5/8		1.125 28.58							26000	28900	31800	VAM HW ST-NA
7		0.730 18.54				35300	39200	43100			ST-D5609	
7		0.812 20.62	20200	22400	24600	Please call VAM Services						VAM HW ST-NB
7		0.812 20.62	27400	30400	33400	20850	23150	25450	20850	23150	25450	SHELL Oil
			22100	24600	27100	28300	31400	34500	28300	31400	34500	VAM HW ST RS
			30000	33300	36600	24100	26800	29500	24700	27500	30300	SHELL DEEP ALEX
						32700	36300	39900	33600	37300	41000	VAM HW ST-NA

Special make-up torques



Size O.D in.	Nominal Weight lb/ft	Wall Thickness in. mm	Grade 80 Ksi			Grades 90-95Ksi			Grade 110 Ksi			Grade 125 Ksi			Drawing	Customer
			Min.	Opti. ft.lb	Max.	Min.	Opti. ft.lb	Max.	Min.	Opti. ft.lb	Max.	Min.	Opti. ft.lb	Max.		
7 5/8		0.712	22800	25300	27800	22800	25300	27800	22800	25300	27800	22800	25300	27800	SI_PD-100511	CHEVRON
8		0.780	30900	34300	37700	16650	18450	20250	30900	34300	37700	30900	34300	37700	ST-D 4817	TEXACO Erskine
8 1/8		0.950	24700	27500	30300	24700	27500	30300	24700	27500	30300	24700	27500	30300	ST-D 5606	SHELL DEEP ALEX
8 5/8		0.750	20850	23150	25450	20850	23150	25450	20850	23150	25450	20850	23150	25450	ST-D5611	VAM HW ST-NA
8 5/8		0.950	27000	30000	33000	27000	30000	33000	27000	30000	33000	27000	30000	33000	ST-D5603	SHELL Oil
8 5/8		0.950	36600	40700	44800	36600	40700	44800	36600	40700	44800	36600	40700	44800	ST-D 5607	VAM HW ST RS
8 5/8		0.950	31200	34700	38200	31200	34700	38200	31200	34700	38200	31200	34700	38200		SHELL DEEP ALEX
8 5/8		0.950	42400	47100	51800	42400	47100	51800	42400	47100	51800	42400	47100	51800		VAM HW ST-NA RS Option
9 1/8		1.000	36400	40500	44600	36400	40500	44600	36400	40500	44600	36400	40500	44600		
9 1/8		0.600	20850	23150	25450	20850	23150	25450	20850	23150	25450	20850	23150	25450	SI_PD-100557	SHELL Oil
10 3/4		0.797	28300	31400	34500	28300	31400	34500	28300	31400	34500	28300	31400	34500	ST-D 5601	MOBIL
10 3/4		0.672	17650	19550	21450	19850	22050	24250	22550	24950	27350	24800	27500	30200	ST-D5604	SHELL and subsid. except SHELL OIL
10 3/4		0.797	23800	26500	29200	26900	29900	32900	30400	33800	37200	33550	37250	40950	SI_PD-100533	SHELL
10 3/4		0.797	36000	40000	44000	36000	40000	44000	36000	40000	44000	36000	40000	44000		VAM HW ST-NI option RS
10 3/4		0.797	48800	54200	59700	48800	54200	59700	48800	54200	59700	48800	54200	59700	ST-D5601	MOBIL
10 3/4		0.797	30500	32000	33500	30500	32000	33500	30500	32000	33500	30500	32000	33500		
10 3/4		0.797	41400	43400	45400	41400	43400	45400	41400	43400	45400	41400	43400	45400	ST-D5612	BP AMOCO
10 3/4		0.960	31500	35000	38500	31500	35000	38500	31500	35000	38500	31500	35000	38500	ST-D5600	SHELL UK/OKIOC
10 3/4		0.960	42800	47600	52400	42800	47600	52400	42800	47600	52400	42800	47600	52400	ST-D5614	SHELL
10 3/4		0.960	31500	35000	38500	31500	35000	38500	31500	35000	38500	31500	35000	38500	ST-D 5608	SHELL and subsid. except SHELL OIL
10 3/4		1.050	42800	47600	52400	42800	47600	52400	42800	47600	52400	42800	47600	52400	ST-D4806	MOBIL
10 3/4		1.050	31500	35000	38500	31500	35000	38500	31500	35000	38500	31500	35000	38500	ST-D4818	ELF Elgin Franklin
10 7/8		0.656	27000	30000	33000	27000	30000	33000	27000	30000	33000	27000	30000	33000	SI_PD-100023	BERKLEY PETROLEUM
12 3/4		0.984	38400	42700	47000	38400	42700	47000	38400	42700	47000	38400	42700	47000	SI_PD-100353	SHELL
		24.99	52100	57900	63700	52100	57900	63700	52100	57900	63700	52100	57900	63700		VAM HW ST-KX SC80

Size O.D in.	Nominal Weight lb/ft	Wall Thicknes in. mm	Grade 80-85 Ksi			Grades 90-95Ksi			Grade 110 ksi			Grade 125 ksi			Drawing	Customer
			Min.	Opti.	Max.	Min.	Opti.	Max.	Min.	Opti.	Max.	Min.	Opti.	Max.		
			ft.lb			ft.lb			ft.lb			ft.lb				
			Nm			Nm			Nm			Nm				
4 1/2	11.60	0.250	3260	3620	3980	3650	4050	4450	4040	4480	4920	4500	4990	5480	ST-D7807/C	SHELL Sarawak VAM TOP-NB
		6.35	4400	4900	5400	4900	5500	6100	5500	6100	6700	6100	6800	7500		
12.60	0.271	3980	3980	4370	4770	3910	4340	4770	4300	4770	5240	4760	5280	5800		
		6.88	4900	5400	5900	5300	5900	6500	5800	6500	7200	6500	7200	7900		
4 1/2	12.60	0.271	3590	3980	4370	3910	4340	4770	4300	4770	5240	4760	5280	5800	SI_PD-7596/A	Marathon Sakhalin VAM TOP-ND Option PC TOTAL E&P Indonesia
		6.88	4900	5400	5900	5300	5900	6500	5800	6500	7200	6500	7200	7900	SI_PD-100274 / A	VAM TOP-NE
4 1/2	13.50	0.290	4040	4480	4920	4430	4920	5410	4760	5280	5800	5080	5640	6200	SI_PD-7826/C	ELF Elgin Franklin VAM TOP-NA
		7.37	5500	6100	6700	6000	6700	7400	6500	7200	7900	6800	7600	8400		
4 1/2	17.00	0.380	5740	6370	7000	5860	6510	7160	6190	6870	7550	6840	7590	8340		
		9.65	7700	8600	9500	7900	8800	9700	8400	9300	10200	9300	10300	11300		
18.90	0.430	7170	7960	8750	9540	7470	8300	9130	7830	8700	9570	8780	9750	10720		
		10.92	9700	10800	11900	10200	11300	12400	10600	11800	13000	11900	13200	14500		
4 1/2	17.00	0.380	6390	7100	7790	7170	7960	8750	7830	8700	9570	8780	9750	10720	SI_PD-7835/B	MOBIL VAM TOP-I
		9.65	8600	9600	10600	9700	10800	11900	10600	11800	13000	11900	13200	14500		
4 1/2	12.60	0.271	3590	3980	4370	3910	4340	4770	4300	4770	5240	4760	5280	5800	SI_PD-7851/E	Elf Syria - BPA Algeria BHP Keith UK Wintershall Tatim China Elf Elgin Franklin UK Marathon Sakhalin Coastal Warton Petrobras Roncador Brazil
		6.88	4900	5400	5900	5300	5900	6500	5800	6500	7200	6500	7200	7900		
13.50	0.290	3710	4120	4530	4940	3970	4410	4850	4430	4920	5410	4880	5420	5960		
		7.37	5000	5600	6200	5400	6000	6600	6000	6700	7400	6700	7400	8100		
15.10	0.337	3850	4270	4690	5110	4300	4770	5240	4760	5280	5800	5140	5710	6280		
		8.56	5200	5800	6400	5800	6500	7200	6500	7200	7900	6900	7700	8500		
17.00	0.380	5740	6370	7000	7630	5860	6510	7160	6190	6870	7550	6840	7590	8340		
		9.65	7700	8600	9500	7900	8800	9700	8400	9300	10200	9300	10300	11300		
18.90	0.430	7170	7960	8750	9540	7470	8300	9130	7830	8700	9570	8780	9750	10720		
		10.92	9700	10800	11900	10200	11300	12400	10600	11800	13000	11900	13200	14500		
23.70	0.560	9850	10850	11850	12850	11100	12300	13500	12450	13750	15050	13700	15200	16700		
		14.22	13200	14700	16200	15000	16700	18400	16700	18600	20500	18500	20600	22700		
4.917		0.303	3590	3980	4380										SI_PD-7842/B	SCHLUMBERGER VAM TOP-ND
		7.70	4900	5400	5900											
5	26.70	0.562	12100	13400	14700	13450	14850	16250	14650	16250	17850	16000	17700	19400	SI_PD-7854/B	HEADINGTON VAM TOP-NA
		14.27	16300	18100	19900	18100	20100	22100	19900	22100	24300	21600	24000	26400		
5 1/6		0.276	4100	4600	5100										SI_PD-7837/B	SCHLUMBERGER VAM TOP-NA
		7.00	5600	6200	6800											
5 1/2	32.60	0.276	15650	17350	19050	18000	19900	21800	19850	22050	24250	20850	23150	25450	SI_PD-7859/B	BP Thunder Horse VAM TOP-NA
		15.88	21100	23500	25900	24300	27000	29700	26900	29900	32900	28300	31400	34500		
5 1/2	17.00	0.304										7830	8700	9570	SI_PD-7809/B	MOBIL VAM TOP-I
		7.72										10600	11800	13000		
20.00		0.362										10450	11550	12650		
		9.19										14100	15700	17300		
5 1/3		0.344	6510	7230	7950										SI_PD-7836/B	SCHLUMBERGER VAM TOP-NA
		8.73	8800	9800	10800											
6	18.60	0.304	6190	6870	7550	6840	7590	8340	8150	9050	9950	8780	9750	10720	SI_PD-7802/B	NAM VAM TOP Sp. Coupling W=163.7mm
		7.72	8400	9300	10200	9300	10300	11300	11100	12300	13500	11900	13200	14500		
6	23.00	0.375	9500	10500	11500	10450	11550	12650	11700	13000	14300	13050	14450	15850	SI_PD-100596/A	Halliburton VAM TOP-NA
		9.53	12800	14200	15600	14100	15700	17300	15900	17700	19500	17600	19600	21600		

Size O.D in.	Nomin al lb/ft	Wall Thickn in. mm	Grade 55 Ksi			Grade 80-85 Ksi			Grades 90-95Ksi			Grade 110 ksi			Grade 125 ksi			Grade 130 Ksi			Drawing	Customer
			Min.	Opti.	Max.	Min.	Opti.	Max.	Min.	Opti.	Max.	Min.	Opti.	Max.	Min.	Opti.	Max.	Min.	Opti.	Max.		
			ft.lb			ft.lb			ft.lb			ft.lb			ft.lb			ft.lb				
			Nm			Nm			Nm			Nm			Nm			Nm				
5 1/2	22	0.400	5500	6150	6800	6500	7230	8000	7200	7960	8800	8100	9040	9900	9100	10130	11100	9500	10500	11600	SI_PD 100608	Sinopec VAM TOP-NB
		10.16	7500	8300	9100	8800	9800	10800	9700	10800	11900	11100	12300	13500	12300	13700	15100	12800	14200	15600		

Special make-up torques

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Size O.D in.	Nomina l Weight lb/ft	Wall Thickness in. mm	Grade 80-85 Ksi			Grades 90-95Ksi			Grade 110 ksi			Grade 125 ksi			Drawing	Customer
			Min.	Opti.	Max.	Min.	Opti.	Max.	Min.	Opti.	Max.	Min.	Opti.	Max.		
6	30.90	0.519 13.18	13700	15200	16700	15300	17000	18700	16900	18800	20700	18300	20300	22300	SI_PD-100401/A	BP VAM TOP KP
6 5/8	28.00	0.417 10.59	12700	14100	15500	14400	15900	17400	16300	18100	19900	24800	27500	30300	SI_PD-7815/C	MOBIL VAM TOP-I
6 5/8	35.00	0.525 13.34	10450	11550	12650	11700	13000	14300	12700	14100	15500	14050	15550	17050	SI_PD-7856/B	SHELL VAM TOP-NA
7	26.00	0.362 9.19	9500	10500	11500	11700	13000	14300	13450	14850	16250	19000	21100	23200	SI_PD-7804/E	MOBIL & QATAR GAS
	29.00	0.408 10.36	12450	13750	15050	14400	15900	17400	16650	18450	20250	18600	20650	22700		VAM TOP-I
	32.00	0.453 11.51	15650	17350	19050	17000	18800	20600	19850	22050	24250	25200	28000	30800		
7	35.00	0.498 12.65	18000	19900	21800	19600	21700	23800	20850	23150	25450	20850	23150	25450	SI_PD-7804/E	MOBIL & QATAR GAS
	38.00	0.540 13.72	20200	22400	24600	20850	23150	25450	20850	23150	25450					VAM TOP-I
	41.00	0.590 14.99	20850	23150	25450	20850	23150	25450	20850	23150	25450	14800	15700	16500		
7	29.00	0.408 10.36	28300	31400	34500	28300	31400	34500	28300	31400	34500	20000	21300	22300	SI_PD-7513/E	Shell Malampaya
7	42.70	0.625 15.88										20850	23150	25450	SI_PD-7825/B	ELF Elgin Franklin
7	46.00	0.670 17.02										28300	31400	34500	SI_PD-7830/B	EXXON VAM TOP-NA
7	49.50	0.730 18.54							20850	23150	25450	28300	31400	34500	SI_PD-7841/B	EXXON MOBIL VAM TOP-NB
	50.10	0.750 19.05							20850	23150	25450					VAM TOP-I
7 1/4	40.00	0.555 14.10	15600	17350	19100	16900	18800	20700	18500	20600	22700	20500	22800	25100	SI_PD-100650	CHEVRON Tengiz VAM TOP-NA
7 5/8	33.70	0.430 10.92	8780	9750	10720	9850	10850	11850							SI_PD-7816/D	NAM/SHELL UK VAM TOP-NA
7 5/8	39.00	0.500 12.7										17000	18800	20600	SI_PD-7829/B	SHELL UK VAM TOP-NC
7 5/8	52.80	0.712 18.08	30600	34000	37400	30600	34000	37400	30600	34000	37400	30600	34000	37400	SI_PD-100582	BP NILE DELTA VAM TOP-NE
7 5/8	52.80	0.712 18.08	28000	31100	34200	28600	31800	34500	30000	33300	36600	30000	33300	36600	SI_PD-100606	BP NILE DELTA VAM TOP-NH
7 3/4	46.10	0.595 15.11	17600	19500	21500	18200	20250	22300	20800	23150	25500	20800	23150	25500	SI_PD-100628	KOC VAM KCX
8 5/8	40.00	0.450 11.43	23800	26400	29000	24800	27500	30300	28300	31400	34500	28300	31400	34500	SI_PD-7810/C	SHELL UK VAM TOP Sp. Coupling W=230mm
10	73.90	0.732 18.59	22500	25000	27500	22500	25000	27500	22500	25000	27500	22500	25000	27500	SI_PD-7864/B	SHELL UK VAM TOP-NB

Special make-up torques



Size O.D in.	Nomina l Weight lb/ft	Wall Thickness in. mm	Grade 130 Ksi			Grades 145 Ksi			Grade 150 ksi			Drawing	Customer
			Min.	Opti.	Max.	Min.	Opti.	Max.	Min.	Opti.	Max.		
10	73.90	0.732 18.59	22500	25000	27500							SI_PD-7864/B	SHELL UK
			30500	33900	37300								VAM TOP-NB



Size O.D in.	Nominal Weight lb/ft	Wall Thckne in. mm	Grade 55 Ksi		Grade 80 Ksi		Grades 90-95Ksi		Grade 110 ksi		Grade 125 ksi		Drawing	Customer	
			Min.	Opti.	Max.	Min.	Opti.	Max.	Min.	Opti.	Max.	Min.			Opti.
			ft.lb	Nm	ft.lb	Nm	ft.lb	Nm	ft.lb	Nm	ft.lb	Nm			
10 1/4	82.00	0.800	27000	3000	33000	27000	30000	33000	27000	30000	33000	27000	30000	SI_PD-7865	CHEVRON Tengiz
		20.32	36600	40700	44800	36600	40700	44800	36600	40700	44800	36600	40700		
10 3/4	55.50	0.495	23900	26600	29300	25400	28200	31000	26600	29600	32600	27800	30900	SI_PD-100476	TOTAL MOHO BILANDO
		12.57	32500	36100	39700	34400	38200	42000	36600	40100	44100	37700	41900		
10 3/4	65.70	0.595	18250	20250	22250	20850	23150	25450	20850	23150	25450			SI_PD-7805	MOBIL New Orleans
		15.11	24700	27500	30300	28300	31400	34500	28300	31400	34500				
10 3/4 x 10.947"						20850	23150	25450						SI_PD-7881	ELF Girassol
						28300	31400	34500							
13 3/8	98.00	0.717				27400	30400	33400						SI_PD-7823	PDO
		18.2				37100	41200	45300							
13 5/8	88.20	0.625	27000	30000	33000	27000	30000	33000	30000	33000	36000	30000	33000	SI_PD-100012	
		15.88	36600	40700	44800	36600	40700	44800	40700	44800	49600	40700	44800		
14	82.20	0.560	26700	29700	32600	27000	30000	33000	27000	30000	33000	27000	30000	SI_PD-100064	Statoil
		14.22	36200	40200	44200	36600	40700	44800	36600	40700	44800	36600	40700		
	96.90	0.670	27000	30000	33000	27000	30000	33000	27000	30000	33000	27000	30000		
		17.02	36600	40700	44800	36600	40700	44800	36600	40700	44800	36600	40700		
	100.00	0.700	27000	30000	33000	27000	30000	33000	27000	30000	33000	27000	30000		
		17.8	36600	40700	44800	36600	40700	44800	36600	40700	44800	36600	40700		
	106.00	0.750	27000	30000	33000	27000	30000	33000	27000	30000	33000	27000	30000		
		19.05	36600	40700	44800	36600	40700	44800	36600	40700	44800	36600	40700		
14	82.20	0.560	25750	28550	31350	27000	30000	33000	27000	30000	33000	27000	30000	SI_PD-100116	
		14.22	34900	38700	42600	36600	40700	44800	36600	40700	44800	36600	40700		
	82.50	0.562	26050	28950	31850	27000	30000	33000	27000	30000	33000	27000	30000		
		14.28	35300	39200	43100	36600	40700	44800	36600	40700	44800	36600	40700		
	86.00	0.600	27000	30000	33000	27000	30000	33000	27000	30000	33000	27000	30000		
		15.24	36600	40700	44800	36600	40700	44800	36600	40700	44800	36600	40700		
	93.00	0.650	27000	30000	33000	27000	30000	33000	27000	30000	33000	27000	30000		
		16.51	36600	40700	44800	36600	40700	44800	36600	40700	44800	36600	40700		
	96.90	0.670	27000	30000	33000	27000	30000	33000	27000	30000	33000	27000	30000		
		17.02	36600	40700	44800	36600	40700	44800	36600	40700	44800	36600	40700		
	100.00	0.700	32400	36000	39600	32400	36000	39600	32400	36000	39600	32400	36000		
		17.8	43900	48800	53700	43900	48800	53700	43900	48800	53700	43900	48800	Total	
	106.00	0.750	39700	44100	48500	39700	44100	48500	39700	44100	48500	39700	44100	Total	
		19.05	53800	59800	65800	53800	59800	65800	53800	59800	65800	53800	59800		
	114.00	0.800	41400	46000	50600	41400	46000	50600	41400	46000	50600	41400	46000		
		20.32	56100	62400	68600	56100	62400	68600	56100	62400	68600	56100	62400		
14 1/2	65.00	0.429	27000	30000	33000	27000	30000	33000	27000	30000	33000	27000	30000	SI_PD-100561	BSP Brunei Shell Petroleum
		10.9	36600	40700	44800	36600	40700	44800	36600	40700	44800	36600	40700		
15	92.50	0.580	30000	33300	36600	30000	33300	36600	30000	33300	36600	30000	33300	SI_PD-100602	WeatherFord
		14.73	40600	45100	49600	40600	45100	49600	40600	45100	49600	40600	45100		
15	107.00	0.675	36400	40500	44600	36400	40500	44600	36400	40500	44600	36400	40500		
		17.15	49400	54900	60400	49400	54900	60400	49400	54900	60400	49400	54900		
16	84.00	0.495	25400	28200	31000	30000	33300	36600	30000	33300	36600	30000	33300	SI_PD-100400	ADMA / ADCO
		12.57	34400	38200	42000	40600	45100	49600	40600	45100	49600	40600	45100		
16	95.00	0.566	45000	50000	55000	45000	50000	55000	45000	50000	55000	45000	50000		
		14.38	61000	67800	74600	61000	67800	74600	61000	67800	74600	61000	67800	TOTAL Norway	
16	109.00	0.656												SI_PD-7867	Unocal
		16.66													

Size O.D	Nominal Weight	Wall Thickness	Grade	Field Make-up						Drawing	Customer
				Tubing + Liner		Tubing		Liner			
in. mm.	lb/ft	in. mm.		min.	opti.	max.	ft.lb N.m		min.	max.	ft.lb N.m
9 5/8	47.00	0.472 11.99	P110	20850 28300	23150 31400	25450 34500	73350 99400	73350 99400	80690 109400	SI_PD-100745	Petrobras VAM TOP-NF



Special make-up torques

Size O.D in.	Nominal Weight lb/ft	Wall Thickness in. mm	Grade 80 Ksi			Grades 90-95Ksi			Grade 110 ksi			Grade 125 ksi			Drawing	Customer
			Min.	Opti.	Max.	Min.	Opti.	Max.	Min.	Opti.	Max.	Min.	Opti.	Max.		
			ft.lb	Nm		ft.lb	Nm		ft.lb	Nm		ft.lb	Nm			
5	18.00	0.362 9.19							8780	9750	10720				SL_PD-100083/A	SHELL TODD VAM TOP HC-KA SC72
5 1/2	32.60	0.625 15.88	16300	18100	19900	18250	20250	22250	20600	22800	25000	20850	23150	25450	SL_PD-9065	BP VAM TOP HC-NA
6	30.90	0.519 13.18	15900	17700	19500	17900	19900	21900	19900	22100	24300	21100	24600	27100	SL_PD-100531_A	VAM TOP HC-KA Special BHP
7	42.70	0.625 15.88	22800	25300	27800	22800	25300	27800	22800	25300	27800	22800	25300	27800	SL_PD-100581	British Gas VAM TOP HC-NB
7 5/8	33.70	0.430 10.92	15300	17000	18700	17650	19550	21450	19850	22050	24250				ST-D 9061/A	EXXON MOBIL
8 5/8	49.00	0.557 14.15	20850	23150	25450	20850	23150	25450	20850	23150	25450	20850	23150	25450	ST-D 9063/A	EXXON MOBIL
9 5/8	43.50 to 58.40	.435 to .595 11.05 to 15.11	28300	31400	34500	28300	31400	34500	28300	31400	34500	28300	31400	34500	ST-D 9062/A	EXXON MOBIL VAM TOP HC-ND
9 5/8	53.50	0.545 13.84	20850	23150	25450	20850	23150	25450	20850	23150	25450	20850	23150	25450	ST-D 7838/A	ARAMCO
9 5/8	58.40	0.595 15.11	20850	23150	25450	20850	23150	25450	20850	23150	25450	20850	23150	25450	ST-D 9060/B	ARAMCO
10 3/4	60.70	0.545 13.84	27000	30000	33000	27000	30000	33000	27000	30000	33000	27000	30000	33000	SL_PD-100109	Total Angola Dalia VAM TOP HC-NA



Special make-up torques

Size O.D in.	Nomina l Weight lb/ft	Wall Thickness in. mm.	Grade 80 Ksi			Grades 90-95Ksi			Grade 110 Ksi			Grade 125 Ksi			Drawing	Customer
			Min.	Opti.	Max.	Min.	Opti.	Max.	Min.	Opti.	Max.	Min.	Opti.	Max.		
			ft.lb	Nm		ft.lb	Nm		ft.lb	Nm		ft.lb	Nm			
4 1/2	13.50	0.290 7.37	6510	7230	7950										ST-D7831/B	NAM
4 1/2	15.10	0.337 8.56	6840	7590	8340				9500	10500	11500					
4 1/2	18.90	0.430 10.92	9150	10150	11150				12800	14200	15600				ST-D7812/B	TOTAL Oil Marine
5	18.00	0.362 9.19							See last page for values						ST-D 7824/C	SHELL UK
5	23.20	0.478 12.14							See last page for values						ST-D 7817/C	SHELL UK
5	26.70	0.562 14.27							See following table						ST-D7863/A	VAM TOP HT-NA BP
5 1/2	20.00	0.361 9.17	9500	10500	11500										ST-D7814/C	TOTAL Thai
5 1/2	29.70	0.562 14.27	18250	20250	22250	20850	23150	26600	20850	23150	30500	20850	23150	34500	ST-D7821/B	American Cometra
5 1/2	32.60	0.625 15.88	24700	27500	30300	28300	31400	36100	28300	31400	41400	28300	31400	46800	ST-D7860/A	VAM TOP HT-NA BP thunder Horse
7	32.00	0.453 11.51	19850	22050	24250	20850	23150	28650	20850	23150	33150	20850	23150	37700		
7	35.00	0.595 15.11	26900	29900	32900	28300	31400	38800	28300	31400	44900	28300	31400	51100	ST-D7822	Maersk
			20850	23150	31400	20850	23150	37100	20850	23150	42950				ST-D7828/B	SHELL group, NAM

Size O.D	Nominal weight lb/ft	Wall thickness in. mm.	Grade	Field Make-up				Mill & licensee		Drawing	Customer	
				Tubing + Liner		Tubing max.	Liner max.	Tubing + Liner				
				min.	opti			ft.lb N.m	min.			max.
5	26.70	0.562 14.27	80 ksi	12700	14100	15500	18450	18450	20250	ST-D 7863/A	VAM TOP HT-NA BP	
			95 ksi	17200	19100	21000	25000	25000	27450			
				13450	14850	16250	22050	22050	24250			
			110 ksi	18100	20100	22100	29900	29900	32850			
			125 ksi	14650	16250	17850	25300	25300	27850			
				19900	22100	24300	34300	34300	37750			
				16000	17700	19400	28550	28550	31450			
				21600	24000	26400	38750	38750	42650			
5	18.00	0.362	Pipe 110 Ksi Coupling	8790	9670	10640	12350	12350	13600	13600	SI_OD-7887	VAM TOP HT
127.00		9.19	125 Ksi	11900	13100	14400	16700	16700	18400	18400	Rep 11	Special Coupling
5 1/2	32.60	0.625	80 ksi	16300	18100	19900	24300	24300	26950	26950	SI_PD-7860	VAM TOP HT-ND BP thunder Horse
		15.88	95 ksi	22000	24500	27000	32950	32950	36500	36500		
				18250	20250	22250	28850	28850	32000	32000		
			110 ksi	24700	27500	30300	39100	39100	43400	43400		
			125 ksi	20200	22400	24600	33450	33450	37150	37150		
				27400	30400	33400	45400	45400	50350	50350		
				20850	23150	25450	38100	38100	41900	41900		
				28300	31400	34500	51700	51700	57350	57350		
7	29.00	0.408	80 ksi	13450	14850	16250	19320	19320	21250	21250	SI_OD-7887	VAM TOP HT Sp.C
177.80		10.36		18200	20100	22000	26200	26200	28800	28800	Rep 9	MAERSK
7	29.00	0.408	80 ksi	13450	14850	16250	19320	19320	21250	21250	SI_OD-7887	VAM TOP HT Sp.C
177.80		10.36	95 Ksi	18200	20100	22000	26200	26200	28800	28800	Rep 6	ADMA
				15300	17000	18700	22780	22780	25060	25060		
				20700	23000	25300	30820	30820	33905	33905		
7 5/8	33.70	0.430	65 ksi	13700	15200	16700	21900	21900	24100	24100	SI_OD-7887	VAM TOP HT Special Coupling BOT
		10.92	80 ksi	18500	20600	22700	29700	29700	32700	32700		
				14400	15900	17400	26800	26800	29450	29450		
			95 ksi	19400	21600	23800	36300	36300	39900	39900		
			110 ksi	16300	18100	19900	31700	31700	34850	34850		
				22100	24500	27000	43000	43000	47300	47300		
			125 ksi	18250	20250	22250	36700	36700	40350	40350		
				24800	27500	30300	49800	49800	54700	54700		
			135/140 ksi	20150	22400	24650	41700	41700	45880	45880		
			150 ksi	27400	30400	33400	56500	56500	62200	62200		
				20850	23150	25450	46000	46000	50600	50600		
				28300	31400	34500	68100	68100	74900	74900		
				20850	23150	25450	50250	50250	55250	55250		
				28300	31400	34500	68100	68100	74900	74900		
7	32.00	0.453	Pipe 110 Ksi Coupling	20700	22800	25100	36130	36130	39740	39740	SI_OD-7887	VAM TOP HT GDF
177.80		11.51	125 Ksi	28100	30900	34000	49000	49000	53900	53900	Rep 10	Special Coupling



Special make-up torques

Size O.D in.	Nominal Weight lb/ft	Wall Thickness in. mm.	Grade 55Ksi			Grade 80Ksi			Grades 90-95ksi			Grade 110 ksi			Mill / Field side	Customer / Drawing
			Min.	Opti.	Max.	Min.	Opti.	Max.	Min.	Opti.	Max.	Min.	Opti.	Max.		
			ft.lb Nm			ft.lb Nm			ft.lb Nm			ft.lb Nm				
8 5/8"															ST-D 7111/A	
10 3/4	55.50	0.495 12.57	Please call VAM Services												Mill side	CAL ENERGY ST-D 7110/B
			Please call VAM Services												Field side + accessories	
	60.70	0.545 13.84	8450 11400	9400 12700	10350 14000									Mill side		
			13500 18300	15900 21600	18300 24900									Field side+ accessories		



Special make-up torques

Size O.D in.	Nominal Weight lb/ft	Wall Thicknes in. mm.	Grade 55Ksi			Grade 80Ksi			Grades 90-95ksi			Grade 110 ksi			Mill / Field side	Customer / Drawing
			Min.	Opti.	Max.	Min.	Opti.	Max.	Min.	Opti.	Max.	Min.	Opti.	Max.		
			ft.lb Nm			ft.lb Nm			ft.lb Nm			ft.lb Nm				
16	94.50	0.566 14.38													Mill side	CAL Energy ST-D 7313 /A Titanium application
															Field side + accessories	
16	97.00	0.579 14.7	19550	21700	23850	19550	21700	23850	19550	21700	23850	19550	21700	23850	Mill side	CHEVRON CHINA ST-D 7311/A
			26500	29400	32300	26500	29400	32300	26500	29400	32300	26500	29400	32300		
			18450	21700	24950	18450	21700	24950	18450	21700	24950	18450	21700	24950	Field side + accessories	
16	97.00	0.579 14.7	25050	29400	33750	25050	29400	33750	25050	29400	33750	25050	29400	33750		CONOCO ST-D 7312/A
			19550	21700	23850	19550	21700	23850	19550	21700	23850	19550	21700	23850	Mill side	
			26500	29400	32300	26500	29400	32300	26500	29400	32300	26500	29400	32300	Field side+	
			18450	21700	24950	18450	21700	24950	18450	21700	24950	18450	21700	24950	Field side+ accessories	
			25050	29400	33750	25050	29400	33750	25050	29400	33750	25050	29400	33750		



Special make-up torques

Size O.D in.	Nominal lb/ft	Wall in. mm.	Grade 80 Ksi			Grades 90-95Ksi			Grade 110 ksi			Grade 125 ksi			Drawing	Customer
			Min.	Opti.	Max.	Min.	Opti.	Max.	Min.	Opti.	Max.	Min.	Opti.	Max.		
			ft.lb Nm			ft.lb Nm			ft.lb Nm			ft.lb Nm				
7	41.00	0.590 14.99	11100	12300	13500	12100	13400	14700	13000	14400	15800	13900	15400	16900	ST-D1713/A	EXXON
			15000	16700	18400	16300	18100	19900	17500	19500	21500	18800	20900	23000		
7 5/8	39.00	0.500 12.7	9400	10500	11600	10300	11400	12500	11200	12400	13600	15300	15900	17500	ST-D1712/B	EXXON
			12800	14200	15600	13900	15500	17100	15100	16800	18500	20700	21600	23700		
7 5/8	47.10	0.625 15.88	13000	14500	16000	21000	23000	25000	28000	30000	32000	27000	30000	33000	ST-D1710/B	EXXON
			17600	19600	21600	28500	31200	33900	38000	40700	43400	36600	40700	44800		
7 5/8	58.31	0.800 20.32	17800	19800	21800	19400	21600	23800	28000	30000	32000	27000	30000	33000	ST-D1711/B	EXXON
			24200	26900	29600	26400	29300	32200	38000	40700	43400	36600	40700	44800		
9 5/8	75.60	0.797 20.24	20800	23100	25400	20800	23100	25400	20800	23100	25400	20800	23100	25400	ST-D1714/A	EXXON
			28300	31400	34500	28300	31400	34500	28300	31400	34500	28300	31400	34500		

Size O.D in.	Nomina l Weight lb/ft	Wall Thickness in. mm.	Grade 80 Ksi			Grades 90-95Ksi			Grade 110 ksi			Grade 125 ksi			Customer
			Min.	Opti. ft.lb	Max.	Min.	Opti. ft.lb	Max.	Min.	Opti. ft.lb	Max.	Min.	Opti. ft.lb	Max.	
5 1/2"	29.70	0.562	7800	8700	9600	8400	9300	10200	8900	9900	10900				With coupling 5 1/2 26#
7"	29.00	0.408	10600	11800	13000	11300	12600	13900	12100	13400	14700				Pemex
9 5/8"	53.50	0.435										24400	27100	29800	Pemex
9 7/8"	68.90	0.700										33100	36800	40500	Murphy SHELL
10 7/8"	72.00	0.656	24400	27100	29800	26100	29000	31900	27600	30700	33800	29300	32500	35750	VAM SLIJ-II NA
10 3/4"	80.80	0.750	33100	36800	40500	35400	39300	43200	37400	41600	45800	39700	44100	48500	
14 1/2"	65.00	0.429	16700	18500	20600	18800	20850	23200	21200	23500	26100	22800	25300	28100	VAM SLIJ-II-NA
15"	107.00	0.675	22600	25100	27900	25500	28300	31400	28700	31900	35400	30900	34300	38100	Special Weatherford Tie back shoe
381.00		17.15	37400	41600	45800	39100	43400	47700	40700	45200	49700	42300	47000	51700	VAM SLIJ-II NA
			50800	56400	62000	52900	58800	64700	55200	61300	67400	57300	63700	70100	Special Weatherford

Size O.D in.	Nomina l Weight lb/ft	Wall Thickness in. mm.	Grade 80 Ksi			Grades 90-95Ksi			Grade 110 ksi			Grade 140 ksi			Customer
			Min.	Opti. ft.lb	Max.	Min.	Opti. ft.lb	Max.	Min.	Opti. ft.lb	Max.	Min.	Opti. ft.lb	Max.	
9 5/8"	47.00	0.472	20850	23150	25450	20850	23150	25450	20850	23150	25450	20850	23150	25450	MAGMA POWER
9 5/8"	53.50	0.435	28300	31400	34500	28300	31400	34500	28300	31400	34500	28300	31400	34500	VAM-I
		13.84	20850	23150	25450	20850	23150	25450	20850	23150	25450	20850	23150	25450	MAGMA POWER
9 5/8"	71.80	0.750	28300	31400	34500	28300	31400	34500	28300	31400	34500	28300	31400	34500	MAGMA POWER

SHELL UK - special Make - up torques for High Torque connection

Size O.D	Nominal weight	Wall thickness	Connection	Grade	Field Make-up						Mill & licensee		Drawing
					Tubing + Liner		Tubing max.	Liner max.	Tubing + Liner				
					min.	opti			min.	max.			
											ft.lb N.m		
in.	lb/ft	in. mm.											
4" 101.60	13.20	0.330 8.38	VAM ACE-I	L80 13Cr	4880	5420	5960	6370	6370	7020	ST-D 4405/B		
	13.20	0.330 8.38	VAM ACE-I	L80 13Cr Mod	6620	7350	8080	8640	8640	9520			
		0.330 8.38	VAM ACE-I	L80 13Cr Mod	5140	5710	6280	6870	6870	7560			
		0.330 8.38	VAM ACE-I	L80 13Cr Mod	6970	7740	8510	9310	9310	10300			
4 1/2" 114.30	13.50	0.290 7.37	VAM ACE MOD-I	L80 13Cr	5740	6370	7000	7450	7450	8170	ST-D 4407/B		
	13.50	0.290 7.37	VAM ACE MOD-I	80 CRA	7780	8640	9500	10100	10100	11100			
		0.290 7.37	VAM ACE MOD-I	L80 13Cr Mod	5740	6370	7000	7380	7380	8120			
		0.290 7.37	VAM ACE MOD-I	L80 13Cr Mod	7780	8640	9500	10000	10000	11000			
	13.50	0.290 7.37	VAM ACE MOD-I	L80 13Cr Mod	6390	7090	7790	7960	7960	8750			
	13.50	0.290 7.37	VAM ACE MOD-I	P110	8650	9610	10570	10800	10800	11800			
		0.290 7.37	VAM ACE MOD-I	P110	6570	7300	8030	9230	9230	10200			
		0.290 7.37	VAM ACE MOD-I	Q 125	8890	9880	10870	12500	12500	13810			
	13.50	0.290 7.37	VAM ACE MOD-I	Q 125	7740	8600	9460	9600	9600	10500			
	13.50	0.290 7.37	VAM ACE MOD-I	125-25Cr	10550	11650	12750	13000	13000	14300			
0.290 7.37		VAM ACE MOD-I	125-25Cr	7740	8600	9460	9600	9600	10500				
4 1/2" 114.30	18.90	0.430 10.92	VAM ACE MOD	125-25Cr	10850	11950	13050	13800	13800	15200	ST-D 4408/B		
	15.10	0.337 8.56	VAM TOP HT-NA	C95 13Cr	14600	16200	17800	18700	18700	20600	ST-D 7831/B		
		0.337 8.56	VAM TOP HT-NA	C95 13Cr	5800	6500	7200	9000	9000	10100			
		0.337 8.56	VAM TOP HT-NA	C95 13Cr	7900	8800	9700	12300	12300	13700			
	18.00	0.362 9.19	VAM TOP HT-KB	L80 (1)	7170	7960	8750	9950	9950	9950	ST-D 7824/C		
	18.00	0.362 9.19	VAM TOP HT-KB	L80 VC13 (1)	9800	10800	11800	13500	12200	13500			
		0.362 9.19	VAM TOP HT-KB	C95 VC13 (1)	7830	8700	9570	11500	10400	11500			
		0.362 9.19	VAM TOP HT-KB	C95 VC13 (1)	10600	11800	13000	15600	14100	15600			
	18.00	0.362 9.19	VAM TOP HT-KB	P110 (1)	8780	9750	10720	12000	10800	12000			
	18.00	0.362 9.19	VAM TOP HT-KB	P110 (1)	11900	13200	14500	16250	14650	16250			
0.362 9.19		VAM TOP HT-KB	Q125 (1)	9500	10500	11500	13850	12550	13850				
0.362 9.19		VAM TOP HT-KB	Q125 (1)	12850	14250	15650	18800	17000	18800				
18.00	0.362 9.19	VAM TOP HT-KB	25Cr-125	9500	10500	11500	11500	10400	11500				
18.00	0.362 9.19	VAM TOP HT-KB	25Cr-125	12850	14250	15650	15650	14150	15650				
	0.362 9.19	VAM TOP HT-KB	25Cr-125	12850	14250	15650	15650	14150	15650				
7" 177.80	23.20	0.478 12.14	VAM TOP HT-KC	L80	10850	11950	13050	15000	13500	15000	ST-D 7817/C		
	29.00	0.408 10.36	VAM TOP HT-SC	L80	14600	16200	17800	20350	18350	20350	ST-D 7866/A		
		0.408 10.36	VAM TOP HT-SC	L80	13450	14850	16250	22050	22050	24250			
		0.408 10.36	VAM TOP HT-SC	L80	18100	20100	22000	29900	29900	32900			
	32.00	0.453 11.51	VAM TOP HT-SC	L80	14050	15550	17050	25450	25450	28000			
	32.00	0.453 11.51	VAM TOP HT-SC	L80	19000	21100	23100	34500	34500	38000			
		0.453 11.51	VAM TOP HT-SC	L80	19000	21100	23100	34500	34500	38000			

(1) Tensile rating of the connection is 65% PBYS, lower than the efficiency of the connection.