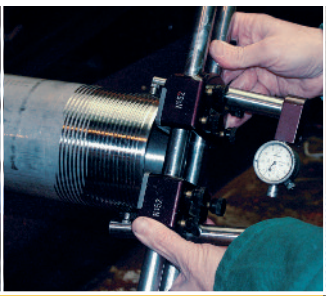
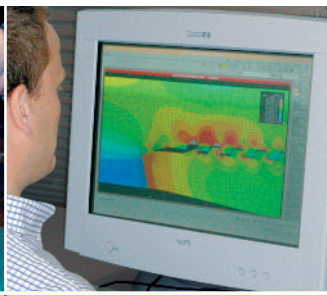
VAM® HTF

High Torque Flush Connection



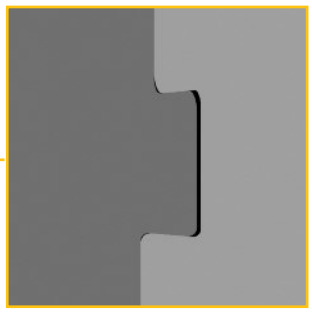
VAM® 21
VAM® TOP
VAM® TOP HC
VAM® TOP HT
VAM® SLIJ II
VAM® FJL
VAM® HTF
VAM® SG
DINO VAM®
BIG OMEGA™
VAM® TOP FE
VAM® HW ST
VAM® MUST

SUMITOMO METALS

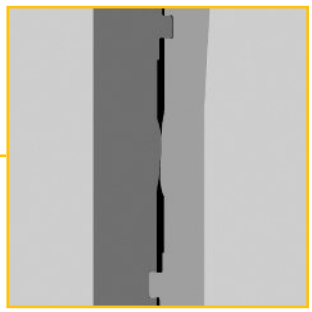
VAM® HTF

Flush OD

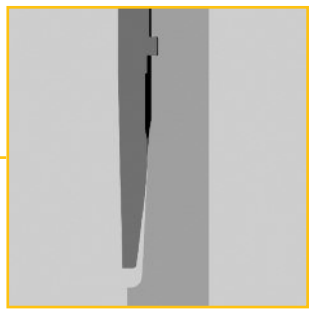
Progressive lead
Dove tail thread



Intermediate metal seal



Internal metal seal



Size (OD)	Nominal Weight	Pipe					Connection			
		Wall Thickness		Nominal ID	Drift diameter	Pipe Section	Pin ID	Make Up Loss	Tensile Efficiency	Thread per inch
inch mm	lb./ft.	inch	mm	inch	inch	sq.inch	inch	inch	%	
4 1/2 114.30	15.10	0.337	8.56	3.826	3.701	4.407	3.733	4.542	63	4
	16.60	0.375	9.53	3.750	3.625	4.860	3.657	5.091	64	4
	17.00	0.380	9.65	3.740	3.615	4.918	3.646	4.907	64	4
	18.90	0.430	10.92	3.640	3.515	5.498	3.546	5.687	64	3.63
	21.50	0.500	12.70	3.500	3.375	6.283	3.407	6.418	64	3.63
5 127.00	18.00	0.362	9.19	4.276	4.151	5.275	4.183	4.769	64	4
	21.40	0.437	11.10	4.126	4.001	6.264	4.033	5.798	65	3.63
	23.20	0.478	12.14	4.044	3.919	6.791	3.950	6.349	64	3.63
	24.10	0.500	12.70	4.000	3.875	7.069	3.907	6.357	64	3.63
	26.70	0.562	14.27	3.876	3.751	7.836	3.800	6.774	64	3.63
5 1/2 139.70	17.00	0.304	7.72	4.892	4.767	4.962	4.798	4.073	61	4
	20.00	0.361	9.17	4.778	4.653	5.828	4.685	4.659	60	4
	23.00	0.415	10.54	4.670	4.545	6.630	4.576	5.289	63	4
	26.00	0.476	12.09	4.548	4.423	7.513	4.454	6.486	65	3.63
7 177.80	23.00	0.317	8.05	6.366	6.250 A	6.656	6.281	4.356	60	3.63
	26.00	0.362	9.19	6.276	6.151	7.549	6.183	5.091	61	3.63
	29.00	0.408	10.36	6.184	6.125 A	8.449	6.157	5.555	61	3.63
	32.00	0.453	11.51	6.094	6.000 A	9.317	6.050	6.364	63	3.63
	35.00	0.498	12.65	6.004	5.879	10.172	5.911	6.691	63	3.63
	38.00	0.540	13.72	5.920	5.795	10.959	5.844	7.709	64	3
7 5/8 193.68	26.40	0.328	8.33	6.969	6.844	7.519	6.876	4.535	59	4
	29.70	0.375	9.53	6.875	6.750	8.541	6.781	4.735	60	4
	33.70	0.430	10.92	6.765	6.640	9.720	6.672	5.722	62	3.63
	39.00	0.500	12.70	6.625	6.500	11.192	6.531	7.099	64	3
	42.80	0.562	14.27	6.501	6.376	12.470	6.426	8.105	64	3
	45.30	0.595	15.11	6.435	6.310	13.141	6.360	8.559	64	3
7 3/4 196.85	46.10	0.595	15.11	6.560	6.500 A	13.374	6.550	8.032	60	3
9 5/8 244.48	40.00	0.395	10.03	8.835	8.750 A	11.454	8.781	5.591	58	3
	43.50	0.435	11.05	8.755	8.599	12.559	8.630	6.354	62	3
	47.00	0.472	11.99	8.681	8.525	13.572	8.557	6.984	64	3
	53.50	0.545	13.84	8.535	8.500 A	15.547	8.550	7.811	60	3
9 7/8 250.83	62.80	0.625	15.88	8.625	8.500 A	18.162	8.550	8.770	67	3

A: Alternate drift

1000 lbs. = 4.44822 kN.
1 ksi. = 1000 psi.
1 psi. = 0.006895 Mpa.
0.06895 bar.

Joint Parting Load calculated on minimum material ultimate strength
L80 U=95 ksi., N80 U=100 ksi., C95 U=105 ksi.,
P110 U=125 ksi., Q125 U=135 ksi.,
140 U=150ksi.

Tensile Performance (1000 lbs.) Parting Load						External Pressure (psi)				
L80	N80	C95	P110	Q125	140	80 ksi.	95 ksi.	110 ksi.	125 ksi.	140 ksi.
264	278	292	347	375	416	11090	12770	14350	15840	17230
295	311	327	389	420	467	12220	14510	16810	19100	21120
299	315	330	393	425	472	12370	14690	17010	19330	21650
334	352	369	440	475	528	13820	16410	19010	21600	24190
382	402	422	503	543	603	15800	18770	21730	24690	27650
321	338	354	422	456	506	10500	12030	13480	14830	16080
387	407	428	509	550	611	12760	15160	17550	19940	22340
413	435	456	543	587	652	13830	16430	19020	21620	24210
430	452	475	566	611	679	14400	17100	19800	22500	25200
476	502	527	627	677	752	15960	18950	21940	24930	27930
288	303	318	378	409	454	6290	6940	7480	7890	8170
332	350	367	437	472	525	8830	10010	11100	12080	12940
397	418	439	522	564	627	11160	12940	14550	16070	17490
464	488	513	610	659	733	12650	15030	17400	19770	22140
379	399	419	499	539	599	3840	4150	4440	4650	4760
437	460	484	576	622	691	5410	5880	6230	6450	6690
490	515	541	644	696	773	7030	7830	8530	9110	9550
558	587	616	734	792	880	8610	9750	10790	11720	12530
609	641	673	801	865	961	10180	11650	13030	14310	15480
666	701	736	877	947	1052	11390	13440	15140	16750	18270
421	444	466	555	599	665	3400	3710	3920	4050	4080
487	512	538	641	692	769	4790	5140	5350	5670	5930
573	603	633	753	814	904	6570	7280	7870	8350	8690
680	716	752	895	967	1074	8820	10000	11080	12060	12920
758	798	838	998	1077	1197	10810	12410	13920	15350	16670
799	841	883	1051	1135	1262	11510	13660	15430	17090	18660
762	802	843	1003	1083	1204	11340	13310	14990	16580	18080
631	664	698	830	897	996	3090	3330	3470	3530	3530
740	779	818	973	1051	1168	3810	4130	4420	4620	4730
825	869	912	1086	1173	1303	4760	5090	5300	5640	5890
886	933	979	1166	1259	1399	6620	7340	7950	8440	8790
1156	1217	1278	1521	1643	1825	8260	9320	10290	11140	11870

Parting Loads are calculated from the minimum material ultimate strength and the critical joint cross section of pin or box as appropriate.

External pressures equal to collapse pressures calculated from API Bul. 5 C 3 section 1.

Size (OD) Inch mm	Nominal Weight lb./ft.	Make Up Torque ft.lbs. (N.m.) All grades from 80 to 140 ksi. Min.	Opt.	Max.
4 1/2	15.10	7450 (10100)	8750 (11900)	10050 (13700)
114.30	16.60	8850 (12000)	10400 (14100)	11950 (16200)
	17.00	9050 (12200)	10650 (14400)	12250 (16600)
	18.90	10600 (14500)	12500 (17000)	14400 (19500)
	21.50	12700 (17300)	14950 (20300)	17200 (23300)
5	18.00	8400 (11400)	9900 (13400)	11400 (15400)
127.00	21.40	9950 (13500)	11700 (15900)	13450 (18300)
	23.20	10750 (14600)	12650 (17200)	14550 (19800)
	24.10	11300 (15300)	13300 (18000)	15300 (20700)
	26.70	12550 (17000)	14750 (20000)	16950 (23000)
5 1/2	17.00	6880 (9400)	8100 (11000)	9320 (12600)
139.70	20.00	8550 (11600)	10050 (13600)	11550 (15600)
	23.00	11000 (15000)	12950 (17600)	14900 (20200)
	26.00	17600 (23800)	20700 (28000)	23800 (32200)
7	23.00	8250 (11100)	9700 (13100)	11150 (15100)
177.80	26.00	10150 (13800)	11950 (16200)	13750 (18600)
	29.00	11050 (15100)	13000 (17700)	14950 (20300)
	32.00	15550 (21100)	18300 (24800)	21050 (28500)
	35.00	18600 (25200)	21900 (29700)	25200 (34200)
	38.00	25650 (34800)	30150 (40900)	34650 (47000)
7 5/8	26.40	7850 (10700)	9250 (12600)	10650 (14500)
193.68	29.70	9750 (13200)	11450 (15500)	13150 (17800)
	33.70	15450 (20900)	18150 (24600)	20850 (28300)
	39.00	20150 (27400)	23700 (32200)	27250 (37000)
	42.80	28250 (38300)	33250 (45100)	38250 (51900)
	45.30	31900 (43300)	37550 (50900)	43200 (58500)
7 3/4				
196.85	46.10	24650 (33400)	29000 (39300)	33350 (45200)
9 5/8	40.00	11450 (15500)	13450 (18200)	15450 (20900)
244.48	43.50	17650 (23900)	20750 (28100)	23850 (32300)
	47.00	19000 (25800)	22350 (30300)	25700 (34800)
	53.50	21200 (28700)	24950 (33800)	28700 (38900)
9 7/8				
250.83	62.80	33300 (45100)	39150 (53100)	45000 (61100)

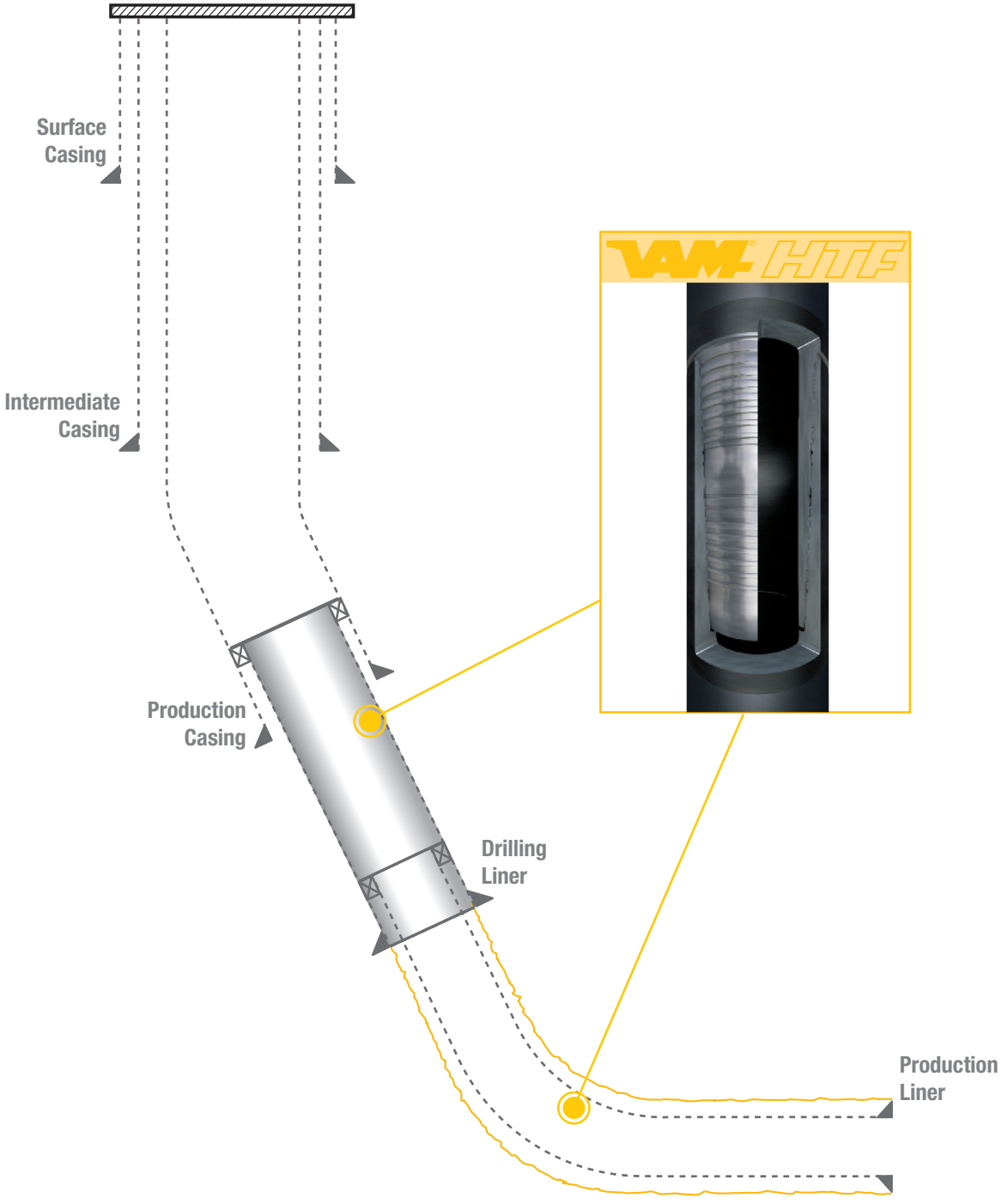
Minimum Internal Yield Pressure (psi)					Nominal Weight	Size (OD)
80 ksi.	95 ksi.	110 ksi.	125 ksi.	140 ksi.	lb./ft.	inch mm
10480	12450	14420	16380	18350	15.10	4 1/2
11670	13850	16040	18230	20420	16.60	114.30
11820	14040	16260	18470	20690	17.00	
13380	15890	18390	20900	23410	18.90	
15560	18470	21390	24310	27220	21.50	
10140	12040	13940	15840	17740	18.00	5
12240	14530	16820	19120	21410	21.40	127.00
13380	15890	18400	20910	23420	23.20	
14000	16630	19250	21880	24500	24.10	
15740	18690	21640	24590	27540	26.70	
7740	9190	10640	12090	13540	17.00	5 1/2
9190	10910	12640	14360	16080	20.00	139.70
10560	12540	14530	16510	18490	23.00	
12120	14390	16660	18930	21200	26.00	
6340	7530	8720	9910	11100	23.00	7
7240	8600	9960	11310	12670	26.00	177.80
8160	9690	11220	12750	14280	29.00	
9060	10760	12460	14160	15860	32.00	
9960	11830	13700	15560	17430	35.00	
10800	12830	14850	16880	18900	38.00	
6020	7150	8280	9410	10540	26.40	7 5/8
6890	8180	9470	10760	12050	29.70	193.68
7900	9380	10860	12340	13820	33.70	
9180	10900	12620	14340	16070	39.00	
10320	12250	14190	16120	18060	42.80	
10920	12970	15020	17070	19120	45.30	
10750	12760	14780	16790	18810	46.10	7 3/4 196.85
5750	6820	7900	8980	10050	40.00	9 5/8
6330	7510	8700	9890	11070	43.50	244.48
6870	8150	9440	10730	12010	47.00	
7930	9410	10900	12390	13870	53.50	
8860	10520	12180	13840	15510	62.80	9 7/8 250.83

Minimum internal yield pressures are calculated from API Bul. 5 C 3 section 3, formula 3.1.1.

Yield Torque ft.lbs. (N.m.)					Nominal Weight	Size (OD)
80 ksi.	95 ksi.	110 ksi.	125 ksi.	140 ksi.	lb./ft.	Inch mm
15500 (21000)	18000 (24000)	20500 (28000)	23000 (31000)	25500 (35000)	15.10	4 1/2
19000 (26000)	22500 (30000)	25500 (35000)	28500 (39000)	32000 (43000)	16.60	114.30
18000 (24000)	21000 (28000)	24000 (32000)	27000 (36000)	29500 (40000)	17.00	
21500 (29000)	24500 (34000)	28000 (38000)	31500 (43000)	35000 (47000)	18.90	
26000 (35000)	30000 (40000)	34000 (46000)	38000 (51000)	42000 (57000)	21.50	
21000 (29000)	24500 (33000)	28000 (38000)	32000 (43000)	35500 (48000)	18.00	5
26500 (36000)	30500 (41000)	35000 (47000)	39500 (53000)	43500 (59000)	21.40	127.00
30500 (41000)	35500 (48000)	40500 (55000)	45500 (62000)	50500 (68000)	23.20	
30500 (41000)	35500 (48000)	40500 (55000)	45000 (61000)	50000 (68000)	24.10	
33000 (45000)	38000 (52000)	43500 (59000)	49000 (66000)	54000 (73000)	26.70	
18500 (25000)	21500 (29000)	24500 (33000)	28000 (38000)	31000 (42000)	17.00	5 1/2
23500 (32000)	27500 (37000)	31500 (43000)	35500 (48000)	39500 (54000)	20.00	139.70
27500 (37000)	32000 (44000)	37000 (50000)	41500 (57000)	46000 (64000)	23.00	
37500 (51000)	44000 (59000)	50000 (68000)	56500 (77000)	63000 (85000)	26.00	
31000 (42000)	36500 (49000)	42000 (57000)	47500 (64000)	53000 (72000)	23.00	7
40500 (55000)	48000 (65000)	55000 (75000)	62000 (84000)	69500 (94000)	26.00	177.80
47500 (64000)	56000 (76000)	64000 (87000)	72500 (98000)	81000 (110000)	29.00	
57500 (78000)	67500 (92000)	78000 (106000)	88000 (119000)	98000 (133000)	32.00	
60000 (81000)	70500 (96000)	81000 (110000)	91500 (124000)	102000 (138000)	35.00	
64000 (87000)	75000 (102000)	86000 (116000)	97000 (131000)	108000 (146000)	38.00	
42500 (57000)	50000 (67000)	57500 (78000)	65000 (88000)	72500 (98000)	26.40	7 5/8
45000 (61000)	53000 (72000)	61000 (83000)	69000 (93000)	77000 (104000)	29.70	193.68
57500 (78000)	68000 (92000)	78000 (106000)	88000 (120000)	98500 (133000)	33.70	
66500 (90000)	78000 (106000)	90000 (122000)	101500 (138000)	113000 (153000)	39.00	
81000 (110000)	95000 (129000)	109000 (148000)	123500 (167000)	137500 (186000)	42.80	
88000 (119000)	103000 (140000)	118000 (160000)	133500 (181000)	148500 (201000)	45.30	
82500 (112000)	97000 (132000)	111500 (151000)	126000 (171000)	140500 (191000)	46.10	7 3/4 196.85
72000 (98000)	85000 (115000)	98000 (133000)	110500 (150000)	123500 (168000)	40.00	9 5/8
87000 (118000)	103000 (139000)	118500 (160000)	134000 (182000)	149500 (203000)	43.50	244.48
101500 (138000)	120000 (162000)	138000 (187000)	156000 (212000)	174500 (236000)	47.00	
120500 (163000)	142000 (193000)	163500 (222000)	185500 (251000)	207000 (281000)	53.50	
147000 (199000)	173000 (235000)	199000 (270000)	225500 (306000)	251500 (341000)	62.80	9 7/8 250.83

Application Example

- Liners to be rotated into place during cementing
- Drilling with Liner
- Casing Drilling
- Slim Hole
- High angle wells
- ERD wells
- Contingency Liner
- High compression loads
- High Pressure/High Temperature wells



VAM® HTF (High Torque Flush) is a true flush OD and ID integral connection providing maximum clearance along with superior torque strength for challenging applications such as drilling with casing, liner rotation to achieve better cementation in highly deviated or critical High Pressure/High Temperature wells.

BENEFITS

- **Proven gas sealability**
- **Maximum clearance (100% flush)**
- **Superior rotational capability**
- **User friendly**
- **ISO CAL-IV qualified**
- **Reliable EP integrity**

Integral flush design

- VAM® HTF is an integral connection threaded on plain-end pipe where the OD of the connection totally flush with the pipe body.
- Current available sizes range from 4-1/2" to 9-7/8" for applications such as drilling with casing, production liners, drilling liners and liners requiring rotation.

Maximum torque strength

- The high torque strength of VAM® HTF permits pipe rotation in deviated holes without fear of structural failure.

Multiple metal-to-metal seal system

- An external and internal metal-to-metal seal work independently of each other to achieve 100% sealability against annular and well bore pressures.

  The gas-tight sealing integrity has been tested and proven under the most severe qualification, ISO13679 CAL-IV.

Streamlined internal and external profile

- The connection OD and ID are 100% flush to the pipe body.
- The ID is bored.
- The OD is turned to flush OD dimension.
- Repairable by VAM® licensed workshops with minor pin-end swaging and box-end expansion prior to threading.

- VAM® HTF (High Torque Flush) is a true flush OD and ID integral connection providing maximum clearance.

Popular VAM® connections

VAM® TOP

VAM® TOP is a T&C connection ideal for tubing and production casing strings applications. VAM® TOP provides gastight sealing under the most severe conditions including great depths, highly deviated holes, and hostile environments. It outperforms the majority of today's premium connections designed according to casing and tubing requirements.

DINO VAM®

A cost effective T&C connection for surface and intermediate casing applications. Increased running reliability and reduced rig costs result from its deep stabbing, non cross-threading and fast make-up. Sealing and structural strength are provided by a coarse 3 TPI tapered, hooked thread design.

VAM® FJL

(Flush Joint Liner)

100% flush ID and OD to provide maximum clearance with optimum strength for liners, moderate depth casing, and tight-hole tubing strings.

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