"Apollo"® Valves
SUBMITTAL SHEET

119 Series
ASME Sections I & VIII Safety Valve

Job Name:	
Job Location:	
Engineer:	
Contractor:	
Tag:	
PO#:	
Rep:	
Wholesale Dist.:	

DESCRIPTION
ASME Sections I & VIII air and steam capacity certified safety valve for overpressure protection of steam power boilers, deaerators, accumulators, pressure reducing stations and pressure piping systems.

FEATURES
- ASME Section I & VIII Certified Capacities
- 5 - 250 psig Set Pressures @ 450° F max*
- 1-1/2" - 6" Class 250 Flanged Inlet Connections
- 2" - 3" FNPT Inlet Connections Available
- Stainless Steel Wetted Trim Standard
- Optically Flat Lapped Metal Seats
- **Made in the USA**

APPROVALS
- ASME Section I Power Boilers
- ASME Section VIII Div 1 Pressure Vessels for Steam, Air/Gas
- Canadian Registration Number 0G8547.5C
- Pressure Equipment Directive 2014/68/EU (PED)

Set pressures and temperatures vary by model.
Refer to catalog for sizing and selection information

STANDARD MATERIALS LIST

BODY	ASTM A126-B Cast Iron
NOZZLE/DISC	ASTM A479 Stainless
SPRING	Stainless Steel or Plated Steel

CAPACITY, LB/HR (KG/HR)
NATIONAL BOARD CAPACITY CERTIFIED, SECTION 1 STEAM

SET PRESSURE PSIG (BAR)	15 (1.03)	100 (6.90)	250 (17.24)
J Orifice	1947 (885)	7227 (3285)	16714 (7597)
K Orifice	2761 (1255)	10250 (4659)	23705 (10775)
L Orifice	4286 (1948)	15913 (7233)	36801 (16727)
M Orifice	5410 (2459)	20085 (9129)	46451 (21114)
N Orifice	6522 (2964)	24215 (11006)	56002 (25455)
P Orifice	9592 (4360)	35615 (16188)	82366 (37439)
Q Orifice	16617 (7553)	61698 (28044)	142687 (64857)
R Orifice	24061 (10936)	89336 (40607)	206603 (93910)

AVAILABLE CONFIGURATIONS

MODEL NUMBER	SIZE	INSTALLED HEIGHT IN. (MM)
119JGC	1-1/2" 250# x 2-1/2" FNPT	15 (381)
119KHC	2" 250# x 3" FNPT	16 (406)
119KHA	2" FNPT x 3" FNPT	16 (406)
119KJC	2-1/2" 250# x 3" FNPT	16 (406)
119KKC	3" 250# x 3" FNPT	16 (406)
119LJC	2-1/2" 250# x 4" FNPT	22 (558)
119LJA	2-1/2" FNPT x 4" FNPT	22 (558)
119LKC	3" 250# x 4" FNPT	22 (558)
119LMC	4" 250# x 4" FNPT	22 (558)
119MKA	3" FNPT x 4" FNPT	22 (558)
119MKC	3" 250# x 4" FNPT	22 (558)
119MMC	4" 250# x 4" FNPT	22 (558)
119NMD	4" 250# x 6" 125#	28 (711)
119PMD	4" 250# x 6" 125#	28 (711)
119QPD	6" 250# x 8" 125#	42 (1066)
119RPD	8" 250# x 8" 125#	42 (1066)

PART NUMBER MATRIX

119	K	H	C	A	MAA	0150	Q
SERIES NUMBER	ORIFICE LETTER	INLET (IN.)	CONNECTION	SERVICE	SPECIAL OPTIONS	SET PRESSURE	SUFFIX
119 - STAINLESS STEEL WETTED TRIM	THE ORIFICE LETTER FROM THE CAPACITY CHART (CPCA9000 PG. 116-119)	G - 1-1/2	A - FNPT X FNPT	A - SEC I STEAM	FACTORY ISSUED LETTERS/NUMBERS (MAA DEFAULT) MCE - CE/PED	SET PRESSURE, PSIG (4 DIGITS)	Q - PERFORMANCE (CALIBRATION) TEST REPORTS
		H - 2	C - 250# X FNPT	K - SEC VIII AIR			
		J - 2-1/2	D - 250# X 125#	L - SEC VIII STEAM			
		K - 3		N - NON CODE AIR			
		M - 4		P - NON CODE STEAM			
		P - 6					

119 SERIES
CAST IRON FLANGED SAFETY VALVE

ASME SECTION I - STEAM
- Pounds per hour (kilograms per hour) saturated steam at 3% overpressure. National Board Certified. Ratings are 90% of actual.

US CUSTOMARY UNITS LB./HR.

ORIFICELETTER AREA IN.²	J 1.358	K 1.926	L 2.99	M 3.774	N 4.55	P 6.692	Q 11.593	R 16.786
SET PRESSURE PSIG								
15	1,947	2,761	4,286	5,410	6,522	9,592	16,617	24,061
20	2,254	3,196	4,962	6,263	7,551	11,105	19,238	27,856
25	2,561	3,632	5,638	7,116	8,579	12,618	21,859	31,651
30	2,868	4,067	6,314	7,969	9,608	14,131	24,480	35,446
35	3,175	4,502	6,990	8,823	10,637	15,644	27,101	39,241
40	3,482	4,938	7,666	9,676	11,665	17,157	29,722	43,036
45	3,789	5,373	8,342	10,529	12,694	18,670	32,343	46,831
50	4,096	5,809	9,018	11,382	13,723	20,183	34,964	50,626
55	4,403	6,244	9,694	12,236	14,751	21,696	37,585	54,421
60	4,710	6,680	10,370	13,089	15,780	23,209	40,206	58,216
65	5,017	7,115	11,046	13,942	16,809	24,722	42,827	62,011
70	5,330	7,559	11,735	14,812	17,858	26,265	45,501	65,882
75	5,646	8,008	12,432	15,691	18,918	27,823	48,200	69,791
80	5,962	8,456	13,128	16,570	19,977	29,382	50,900	73,700
85	6,279	8,905	13,824	17,449	21,037	30,940	53,600	77,609
90	6,595	9,353	14,520	18,328	22,096	32,498	56,299	81,518
95	6,911	9,802	15,217	19,207	23,156	34,057	58,999	85,427
100	7,227	10,250	15,913	20,085	24,215	35,615	61,698	89,336
105	7,544	10,699	16,609	20,964	25,275	37,173	64,398	93,245
110	7,860	11,147	17,305	21,843	26,334	38,732	67,098	97,154
115	8,176	11,596	18,002	22,722	27,394	40,290	69,797	101,063
120	8,492	12,044	18,698	23,601	28,453	41,848	72,497	104,971
125	8,809	12,493	19,394	24,480	29,513	43,407	75,197	108,880
130	9,125	12,941	20,091	25,358	30,573	44,965	77,896	112,789
135	9,441	13,390	20,787	26,237	31,632	46,524	80,596	116,698
140	9,757	13,838	21,483	27,116	32,692	48,082	83,295	120,607
145	10,073	14,287	22,179	27,995	33,751	49,640	85,995	124,516
150	10,390	14,735	22,876	28,874	34,811	51,199	88,695	128,425
155	10,706	15,184	23,572	29,753	35,870	52,757	91,394	132,334
160	11,022	15,632	24,268	30,631	36,930	54,315	94,094	136,243
165	11,338	16,081	24,964	31,510	37,989	55,874	96,794	140,152
170	11,655	16,529	25,661	32,389	39,049	57,432	99,493	144,061
175	11,971	16,978	26,357	33,268	40,108	58,990	102,193	147,969
180	12,287	17,426	27,053	34,147	41,168	60,549	104,893	151,878
185	12,603	17,875	27,750	35,026	42,228	62,107	107,592	155,787
190	12,920	18323	28,446	35,905	43,287	63,665	110,292	159,696
195	13,236	18772	29,142	36,783	44,347	65,224	112,991	163,605
200	13,552	19220	29,838	37,662	45,406	66,782	115,691	167,514
205	13,868	19669	30,535	38,541	46,466	68,340	118,391	171,423
210	14,184	20117	31,231	39,420	47,525	69,899	121,090	175,332
215	14,501	20566	31,927	40,299	48,585	71,457	123,790	179,241
220	14,817	21014	32,623	41,178	49,644	73,015	126,490	183,150
225	15,133	21463	33,320	42,056	50,704	74,574	129,189	187,059
230	15,449	21911	34,016	42,935	51,764	76,132	131,889	190,958
235	15,766	22360	34,712	43,814	52,823	77,691	134,589	194,876
240	16,082	22808	35,409	44,693	53,883	79,249	137,288	198,785
245	16,398	23257	36,105	45,572	54,942	80,807	139,988	202,694
250	16,714	23705	36,801	46,451	56,002	82,366	142,687	206,603
Approx. 1 psi Increments	63	90	139	176	212	312	540	782

METRIC UNITS KG/HR.

ORIFICE LETTER AREA CM.²	J 8.762	K 12.426	L 19.287	M 24.347	N 29.357	P 43.174	Q 74.795	R 108.294
SET PRESSURE BARG								
1.1	910	1,290	2,002	2,527	3,048	4,482	7,764	11,242
1.5	1,071	1,519	2,358	2,976	3,589	5,278	9,144	13,239
2	1,273	1,806	2,803	3,538	4,266	6,274	10,868	15,736
2.5	1,475	2,092	3,247	4,099	4,943	7,269	12,593	18,233
3	1,677	2,379	3,692	4,660	5,619	8,264	14,317	20,729
3.5	1,879	2,665	4,137	5,222	6,296	9,260	16,041	23,226
4	2,081	2,952	4,581	5,783	6,973	10,255	17,766	25,723
4.5	2,283	3,238	5,026	6,344	7,650	11,250	19,490	28,219
5	2,490	3,531	5,481	6,919	8,343	12,270	21,256	30,776
5.5	2,698	3,827	5,939	7,497	9,040	13,295	23,032	33,348
6	2,906	4,122	6,397	8,075	9,737	14,320	24,808	35,919
6.5	3,114	4,417	6,855	8,653	10,434	15,345	26,584	38,491
7	3,322	4,712	7,313	9,232	11,131	16,371	28,360	41,062
7.5	3,530	5,007	7,771	9,810	11,828	17,396	30,136	43,634
8	3,738	5,302	8,229	10,388	12,526	18,421	31,912	46,205
8.5	3,947	5,597	8,687	10,966	13,223	19,446	33,689	48,777
9	4,155	5,892	9,145	11,544	13,920	20,471	35,465	51,349
9.5	4,363	6,187	9,603	12,122	14,617	21,497	37,241	53,920
10	4,571	6,482	10,061	12,700	15,314	22,522	39,017	56,492
10.5	4,779	6,777	10,519	13,279	16,011	23,547	40,793	59,063
11	4,987	7,072	10,977	13,857	16,708	24,572	42,569	61,635
11.5	5,195	7,367	11,435	14,435	17,405	25,598	44,345	64,206
12	5,403	7,662	11,893	15,013	18,102	26,623	46,121	66,778
12.5	5,611	7,958	12,351	15,591	18,800	27,648	47,897	69,349
13	5,819	8,253	12,809	16,169	19,497	28,673	49,673	71,921
13.5	6,027	8,548	13,267	16,747	20,194	29,698	51,449	74,492
14	6,235	8,843	13,725	17,325	20,891	30,724	53,225	77,064
15	6,651	9,433	14,641	18,482	22,285	32,774	56,777	82,207
16	7,068	10,023	15,557	19,638	23,679	34,824	60,330	87,350
17	7,484	10,613	16,473	20,794	25,073	36,875	63,882	92,493
Approx 0.1 barg Increments	41.6	59.0	91.6	115.6	139.4	205.0	355.2	514.3

119 SERIES
CAST IRON FLANGED SAFETY

ASME SECTION VIII - STEAM
- Pounds per hour (kilograms per hour) saturated steam at 10% overpressure. National Board Certified. Ratings are 90% of actual.

US CUSTOMARY UNITS LB./HR.

ORIFICE LETTER AREA IN.²	J 1.358	K 1.926	L 2.99	M 3.774	N 4.55	P 6.692	Q 11.593	R 16.786
SET PRESSURE PSIG								
5*	1,312	1,860	2,888	3,645	4,395	6,464	11,198	16,213
10*	1,798	2,550	3,957	4,995	6,023	8,859	15,346	22,220
15	2,008	2,848	4,421	5,580	6,728	9,895	17,141	24,820
20	2,315	3,283	5,097	6,433	7,756	11,408	19,762	28,615
25	2,622	3,719	5,773	7,287	8,785	12,921	22,383	32,410
30	2,929	4,154	6,449	8,140	9,814	14,434	25,004	36,205
35	3,267	4,633	7,193	9,079	10,945	16,098	27,887	40,379
40	3,604	5,112	7,936	10,017	12,077	17,762	30,771	44,554
45	3,942	5,591	8,680	10,956	13,208	19,426	33,654	48,729
50	4,280	6,070	9,423	11,894	14,340	21,091	36,537	52,903
55	4,618	6,549	10,167	12,833	15,471	22,755	39,420	57,078
60	4,955	7,028	10,911	13,771	16,603	24,419	42,303	61,252
65	5,293	7,507	11,654	14,710	17,735	26,083	45,186	65,427
70	5,631	7,986	12,398	15,649	18,866	27,748	48,069	69,601
75	5,969	8,465	13,141	16,587	19,998	29,412	50,952	73,776
80	6,306	8,944	13,885	17,526	21,129	31,076	53,835	77,951
85	6,644	9,423	14,629	18,464	22,261	32,740	56,719	82,125
90	6,982	9,902	15,372	19,403	23,392	34,405	59,602	86,300
95	7,319	10,381	16,116	20,341	24,524	36,069	62,485	90,474
100	7,657	10,860	16,859	21,280	25,655	37,733	65,368	94,649
105	7,995	11,339	17,603	22,218	26,787	39,397	68,251	98,823
110	8,333	11,818	18,346	23,157	27,919	41,062	71,134	102,998
115	8,670	12,297	19,090	24,096	29,050	42,726	74,017	107,173
120	9,008	12,776	19,834	25,034	30,182	44,390	76,900	111,347
125	9,346	13,255	20,577	25,973	31,313	46,055	79,783	115,522
130	9,684	13,734	21,321	26,911	32,445	47,719	82,666	119,696
135	10,021	14,213	22,064	27,850	33,576	49,383	85,550	123,871
140	10,359	14,692	22,808	28,788	34,708	51,047	88,433	128,045
145	10,697	15,171	23,552	29,727	35,839	52,712	91,316	132,220
150	11,034	15,650	24,295	30,666	36,971	54,376	94,199	136,395
155	11,372	16,129	25,039	31,604	38,103	56,040	97,082	140,569
160	11,710	16,608	25,782	32,543	39,234	57,704	99,965	144,744
165	12,048	17,087	26,526	33,481	40,366	59,369	102,848	148,918
170	12,385	17,566	27,270	34,420	41,497	61,033	105,731	153,093
175	12,723	18,045	28,013	35,358	42,629	62,697	108,614	157,267
180	13,061	18,524	28,757	36,297	43,760	64,361	111,497	161,442
185	13,399	19,003	29,500	37,236	44,892	66,026	114,381	165,617
190	13,736	19,482	30,244	38,174	46,023	67,690	117,264	169,791
195	14,074	19,961	30,988	39,113	47,155	69,354	120,147	173,966
200	14,412	20,440	31,731	40,051	48,287	71,018	123,030	178,140
205	14,749	20,919	32,475	40,990	49,418	72,683	125,913	182,315
210	15,087	21,398	33,218	41,928	50,550	74,347	128,796	186,489
215	15,425	21,876	33,962	42,867	51,681	76,011	131,679	190,664
220	15,763	22,355	34,706	43,806	52,813	77,675	134,562	194,839
225	16,100	22,834	35,449	44,744	53,944	79,340	137,445	199,013
230	16,438	23,313	36,193	45,683	55,076	81,004	140,329	203,188
235	16,776	23,792	36,936	46,621	56,207	82,668	143,212	207,362
240	17,113	24,271	37,680	47,560	57,339	84,332	146,095	211,537
245	17,451	24,750	38,424	48,498	58,471	85,997	148,978	215,711
250	17,789	25,229	39,167	49,437	59,602	87,661	151,861	219,886
Approx. 1 psi Increment	68	96	149	188	226	333	577	835

Settings below 15 psi (1.1 barg) are non-ASME code.

METRIC UNITS KG/HR.

ORIFICE LETTER AREA CM.²	J 8.762	K 12.426	L 19.287	M 24.347	N 29.357	P 43.174	Q 74.795	R 108.294
SET PRESSURE BARG								
.34*	590	836	1,298	1,639	1,976	2,906	5,034	7,289
.69*	822	1,165	1,809	2,283	2,753	4,049	7,014	10,155
1.1	937	1,329	2,064	2,605	3,141	4,619	8,002	11,586
1.5	1,099	1,559	2,419	3,054	3,682	5,415	9,382	13,584
2	1,301	1,845	2,864	3,615	4,359	6,411	11,106	16,080
2.5	1,520	2,156	3,347	4,225	5,094	7,492	12,979	18,792
3	1,743	2,471	3,836	4,842	5,839	8,587	14,876	21,539
3.5	1,965	2,787	4,325	5,460	6,583	9,682	16,773	24,285
4	2,187	3,102	4,814	6,077	7,328	10,777	18,670	27,031
4.5	2,409	3,417	5,303	6,695	8,072	11,872	20,566	29,778
5	2,632	3,732	5,793	7,312	8,817	12,967	22,463	32,524
5.5	2,854	4,047	6,282	7,929	9,561	14,061	24,360	35,270
6	3,076	4,362	6,771	8,547	10,306	15,156	26,257	38,017
6.5	3,298	4,677	7,260	9,164	11,050	16,251	28,153	40,763
7	3,520	4,992	7,749	9,782	11,795	17,346	30,050	43,509
7.5	3,743	5,308	8,238	10,399	12,539	18,441	31,947	46,255
8	3,965	5,623	8,727	11,017	13,284	19,536	33,844	49,002
8.5	4,187	5,938	9,216	11,634	14,028	20,631	35,741	51,748
9	4,409	6,253	9,706	12,251	14,773	21,726	37,637	54,494
9.5	4,631	6,568	10,195	12,869	15,517	22,820	39,534	57,241
10	4,854	6,883	10,684	13,486	16,262	23,915	41,431	59,987
10.5	5,076	7,198	11,173	14,104	17,006	25,010	43,328	62,733
11	5,298	7,513	11,662	14,721	17,750	26,105	45,224	65,480
11.5	5,520	7,829	12,151	15,338	18,495	27,200	47,121	68,226
12	5,742	8,144	12,640	15,956	19,239	28,295	49,018	70,972
12.5	5,965	8,459	13,129	16,573	19,984	29,390	50,915	73,718
13	6,187	8,774	13,618	17,191	20,728	30,485	52,811	76,465
13.5	6,409	9,089	14,108	17,808	21,473	31,580	54,708	79,211
14	6,631	9,404	14,597	18,426	22,217	32,674	56,605	81,957
15	7,076	10,034	15,575	19,660	23,706	34,864	60,399	87,450
16	7,520	10,665	16,553	20,895	25,195	37,054	64,192	92,943
17	7,964	11,295	17,531	22,130	26,684	39,244	67,986	98,435
Approx. 0.1 barg Increment	44.4	63.0	97.8	123.5	148.9	219.0	379.4	549.3

119 SERIES
CAST IRON FLANGED SAFETY

ASME SECTION VIII - AIR
- Standard cubic feet per minute (normalized cubic meters per hour) of air at 10% overpressure. National Board Certified. Ratings are 90% of actual.

US CUSTOMARY UNITS SCFM

ORIFICE LETTER AREA IN.²	J 1.358	K 1.926	L 2.99	M 3.774	N 4.55	P 6.692	Q 11.593	R 16.786
SET PRESSURE PSIG								
5*	418	592	919	1,160	1,399	2,058	3,565	5,161
10*	583	826	1,282	1,619	1,952	2,870	4,973	7,200
15	715	1,014	1,574	1,986	2,395	3,522	6,101	8,834
20	824	1,169	1,814	2,290	2,761	4,060	7,034	10,185
25	933	1,324	2,055	2,594	3,127	4,599	7,967	11,536
30	1,043	1,479	2,295	2,897	3,493	5,138	8,900	12,887
35	1,163	1,649	2,560	3,231	3,896	5,730	9,926	14,373
40	1,283	1,820	2,825	3,566	4,299	6,322	10,953	15,859
45	1,403	1,990	3,089	3,900	4,701	6,915	11,979	17,345
50	1,523	2,161	3,354	4,234	5,104	7,507	13,005	18,830
55	1,644	2,331	3,619	4,568	5,507	8,099	14,031	20,316
60	1,764	2,502	3,884	4,902	5,910	8,692	15,057	21,802
65	1,884	2,672	4,148	5,236	6,312	9,284	16,084	23,288
70	2,004	2,843	4,413	5,570	6,715	9,877	17,110	24,774
75	2,124	3,013	4,678	5,904	7,118	10,469	18,136	26,260
80	2,245	3,184	4,942	6,238	7,521	11,061	19,162	27,746
85	2,365	3,354	5,207	6,572	7,924	11,654	20,188	29,232
90	2,485	3,524	5,472	6,906	8,326	12,246	21,215	30,718
95	2,605	3,695	5,736	7,240	8,729	12,838	22,241	32,204
100	2,726	3,865	6,001	7,574	9,132	13,431	23,267	33,689
105	2,846	4,036	6,266	7,908	9,535	14,023	24,293	35,175
110	2,966	4,206	6,530	8,243	9,937	14,616	25,320	36,661
115	3,086	4,377	6,795	8,577	10,340	15,208	26,346	38,147
120	3,206	4,547	7,060	8,911	10,743	15,800	27,372	39,633
125	3,327	4,718	7,324	9,245	11,146	16,393	28,398	41,119
130	3,447	4,888	7,589	9,579	11,548	16,985	29,424	42,605
135	3,567	5,059	7,854	9,913	11,951	17,577	30,451	44,091
140	3,687	5,229	8,118	10,247	12,354	18,170	31,477	45,577
145	3,807	5,400	8,383	10,581	12,757	18,762	32,503	47,063
150	3,928	5,570	8,648	10,915	13,160	19,355	33,529	48,549
155	4,048	5,741	8,912	11,249	13,562	19,947	34,556	50,034
160	4,168	5,911	9,177	11,583	13,965	20,539	35,582	51,520
165	4,288	6,082	9,442	11,917	14,368	21,132	36,608	53,006
170	4,408	6,252	9,706	12,251	14,771	21,724	37,634	54,492
175	4,529	6,423	9,971	12,586	15,173	22,317	38,660	55,978
180	4,649	6,593	10,236	12,920	15,576	22,909	39,687	57,464
185	4,769	6,764	10,500	13,254	15,979	23,501	40,713	58,950
190	4,889	6,934	10,765	13,588	16,382	24,094	41,739	60,436
195	5,010	7,105	11,030	13,922	16,784	24,686	42,765	61,922
200	5,130	7,275	11,294	14,256	17,187	25,278	43,791	63,408
205	5,250	7,446	11,559	14,590	17,590	25,871	44,818	64,893
210	5,370	7,616	11,824	14,924	17,993	26,463	45,844	66,379
215	5,490	7,787	12,088	15,258	18,396	27,056	46,870	67,865
220	5,611	7,957	12,353	15,592	18,798	27,648	47,896	69,351
225	5,731	8,128	12,618	15,926	19,201	28,240	48,923	70,837
230	5,851	8,298	12,883	16,260	19,604	28,833	49,949	72,323
235	5,971	8,469	13,147	16,594	20,007	29,425	50,975	73,809
240	6,091	8,639	13,412	16,929	20,409	30,017	52,001	75,295
245	6,212	8,810	13,677	17,263	20,812	30,610	53,027	76,781
250	6,332	8,980	13,941	17,597	21,215	31,202	54,054	78,267
Approx. 1 psi Increment	24	34	53	67	81	118	205	297

Settings below 15 psi (1.1 barg) are non-ASME code.

METRIC UNITS Nm3/HR.

ORIFICE LETTER AREA CM.²	J 8.762	K 12.426	L 19.287	M 24.347	N 29.357	P 43.174	Q 74.795	R 108.294
SET PRESSURE BARG								
0.4*	722	1,024	1,589	2,006	2,418	3,557	6,161	8,921
0.8*	1,005	1,425	2,212	2,793	3,367	4,952	8,579	12,422
1.1	1,182	1,677	2,603	3,286	3,961	5,826	10,093	14,615
1.5	1,386	1,996	3,052	3,852	4,644	6,831	11,833	17,134
2	1,641	2,327	3,613	4,560	5,498	8,086	14,008	20,283
2.5	1,918	2,720	4,222	5,329	6,425	9,449	16,370	23,703
3	2,198	3,117	4,839	6,108	7,364	10,830	18,762	27,166
3.5	2,478	3,514	5,456	6,887	8,303	12,211	21,154	30,630
4	2,758	3,912	6,073	7,665	9,241	13,592	23,546	34,094
4.5	3,038	4,309	6,690	8,444	10,180	14,973	25,938	37,557
5	3,319	4,707	7,307	9,223	11,119	16,354	28,331	41,021
5.5	3,599	5,104	7,924	10,002	12,058	17,735	30,723	44,485
6	3,879	5,502	8,541	10,780	12,997	19,115	33,115	47,948
6.5	4,159	5,899	9,158	11,559	13,936	20,496	35,507	51,412
7	4,439	6,296	9,775	12,338	14,875	21,877	37,899	54,876
7.5	4,720	6,694	10,392	13,116	15,813	23,258	40,291	58,339
8	5,000	7,091	11,009	13,895	16,752	24,639	42,683	61,803
8.5	5,280	7,489	11,626	14,674	17,691	26,020	45,076	65,267
9	5,560	7,886	12,243	15,453	18,630	27,400	47,468	68,730
9.5	5,841	8,283	12,860	16,231	19,569	28,781	49,860	72,194
10	6,121	8,681	13,477	17,010	20,508	30,162	52,252	75,658
10.5	6,401	9,078	14,093	17,789	21,447	31,543	54,644	79,121
11	6,681	9,476	14,710	18,568	22,385	32,924	57,036	82,585
11.5	6,961	9,873	15,327	19,346	23,234	34,305	59,428	86,049
12	7,242	10,271	15,944	20,125	24,263	35,686	61,820	89,512
12.5	7,522	10,668	16,561	20,904	25,202	37,066	64,213	91,976
13	7,802	11,065	17,178	21,683	26,141	38,447	66,605	96,440
13.5	8,082	11,463	17,795	22,461	27,080	39,828	68,997	99,903
14	8,362	11,860	18,412	23,240	28,019	41,209	71,389	103,367
15	8,923	12,655	19,646	27,798	29,896	43,971	76,173	110,294
16	9,483	13,450	20,880	26,355	31,774	46,732	80,958	117,222
17	10,444	14,245	22,114	27,912	33,652	49,494	85,742	124,149
Approx. 0.1 barg Increment	56.0	79.5	123.4	155.8	187.8	276.2	478.4	692.7