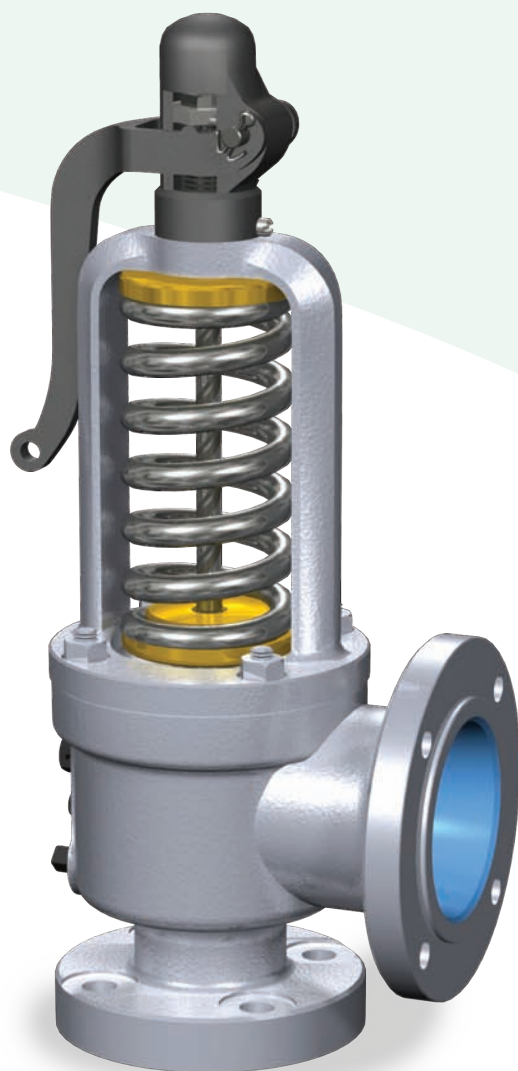


# 1511

## Safety Valve



CONSOLIDATED Type 1511 safety valves are designed for low pressure, steam heating boilers and steam generators as well as air service applications.

1511



**INLET SIZES** — 1-1/2" through 6" in either flanged or threaded design.

**INLET RATINGS** — ANSI Class 250

**OUTLET SIZES** — 2-1/2" through 4" threaded, 6" and 8" in either flanged or threaded design.

**OUTLET RATINGS** — ANSI Class 125

**ORIFICE SIZES** — Eight sizes: H through Q

**TEMPERATURE RANGE** — -20°F to 406°F

**MATERIALS** — Cast iron body with brass trim is standard. Stainless steel trim is optional.

**CERTIFICATION** — ASME B&PVC Section I and VIII

**BLOWDOWN** — 4%

**BACK PRESSURE LIMIT** — 20% of Set Pressure

## Table of Contents

Scope of Design .....1511.1  
 Materials .....1511.2  
 Dimensions & Weights .....1511.3  
 Orifice Capacities .....1511.5

### Scope of Design

Inlet Size	Valve Type	Orifice Discharge Area		Connections	
		Sq. in	Sq. cm	Inlet* ANSI STD RF	Outlet ANSI STD
1-1/2"	1511H	0.785	5.065	1-1/2" 250 class	2-1/2" NPT(internal)
1-1/2"	1511J	1.287	8.304	1-1/2" 250 class	2-1/2" NPT(internal)
2"	1511K	1.840	11.872	2" 250 class	3" NPT(internal)
2-1/2"	1511L	2.853	18.408	2-1/2" 250 class	4" NPT (internal)
3"	1511M	3.600	23.227	3" 250 class	4" NPT(internal)
4"	1511N	4.340	28.002	4" 250 class	6" 125 class F.F.
4"	1511P	6.380	41.164	4" 250 class	6" 125 class F.F.
6"	1511Q	11.050	71.295	6" 250 class	8" 125 class F.F.

\* Inlet connection available with ANSI class 125 FF on application

### Enlarge Inlet Flange Option ANSI Class 250 Replacement Valves

Orifice	Enlarge Inlet Flange
H	2", 2-1/2", 3"
J	2", 2-1/2", 3"
K	2-1/2", 3", 3-1/2", 4"
L	3", 3-1/2", 4"
M	3-1/2", 4", 4-1/2"

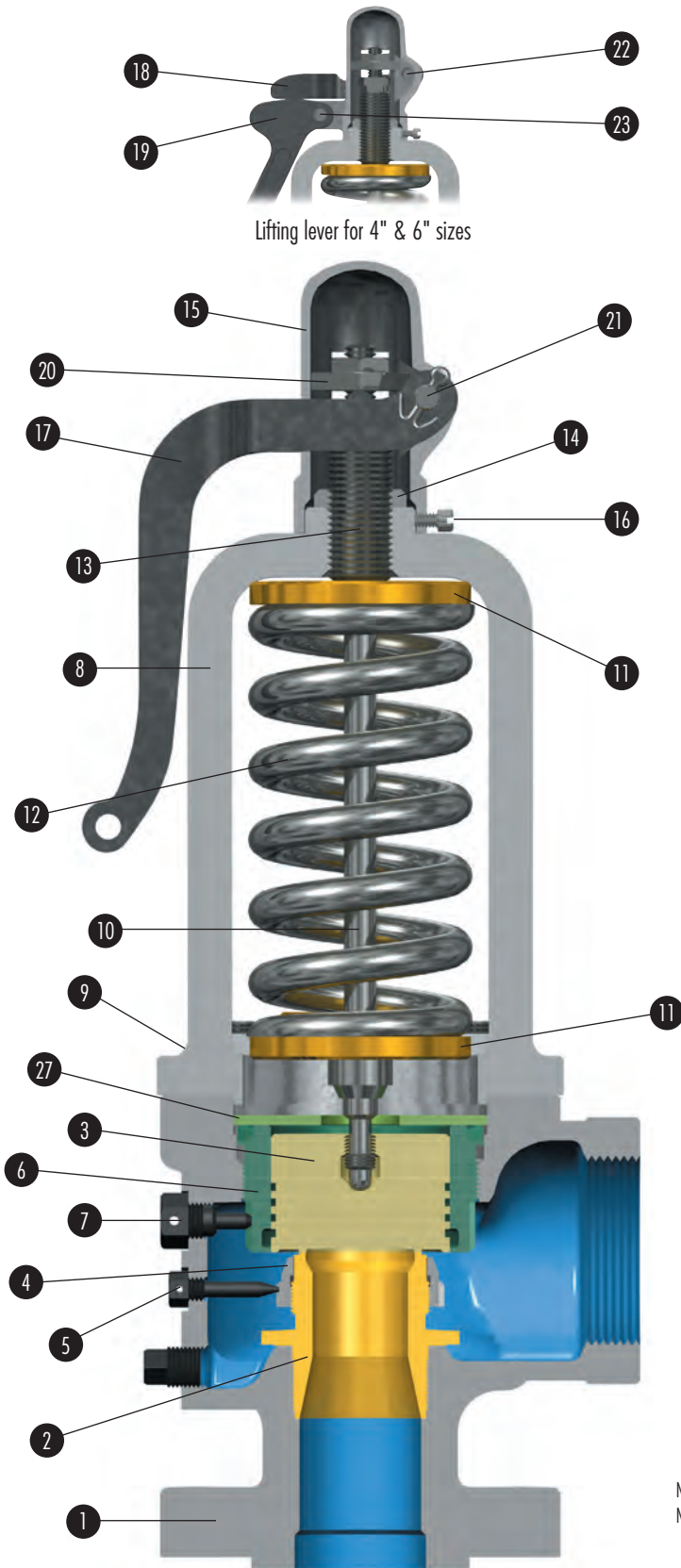
### Pressure/Temperature Limits

Valve Type	Set Pressure Limit	Temperature Limit
1511	250 PSIG	406°F 207°C
1511_S	250 PSIG	406°F 207°C

## ! CAUTION

Because the 1511 valve is not totally enclosed, upon actuation the system media will escape from the following locations:

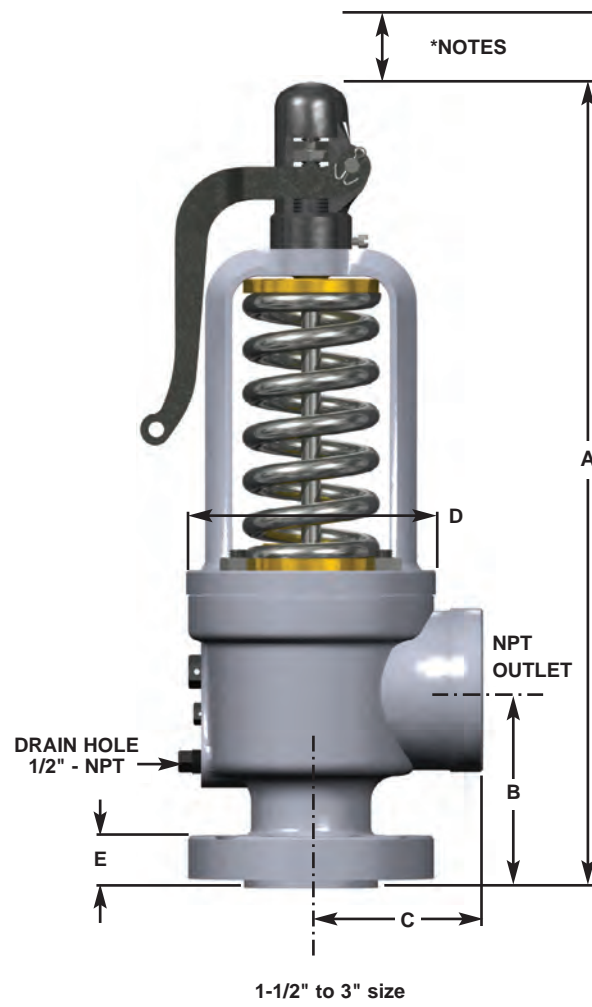
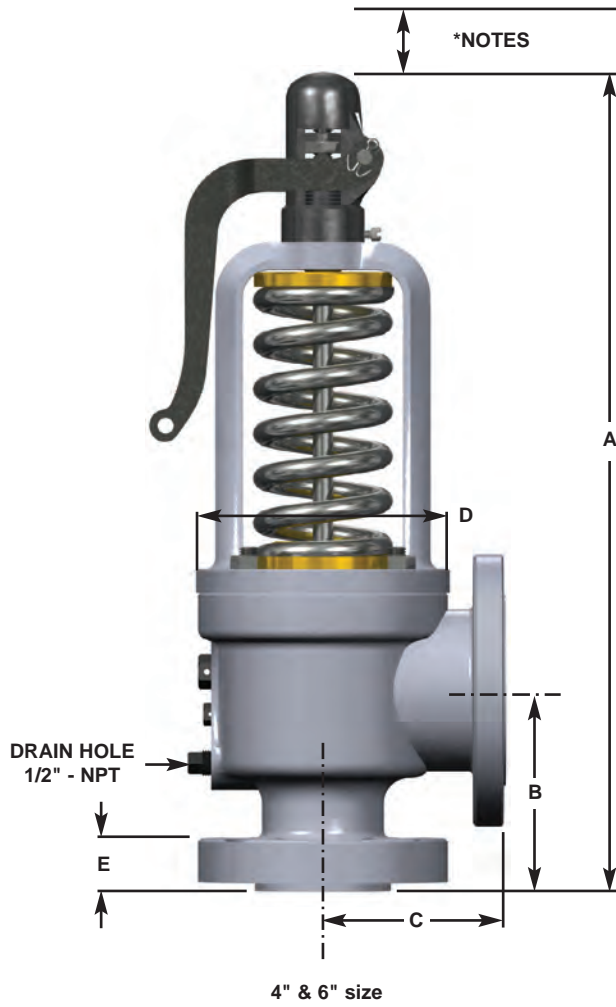
- (1) The valve outlet which is the main discharge area.
- (2) The open yoke will also allow a small amount of steam to exhaust vertically.
- (3) The drain hole at the base of the valve.



Part	Material
1 Base	Iron
2 Seat Bushing (Note 2)	Bronze
3 Disc (Notes 1 & 2)	Bronze
4 Lower Adj. Ring (H-L Orifice)	Brass
4 Lower Adj. Ring (M-Q Orifice)	Bronze
5 Lower Adj. Ring Pin	Brass
6 Upper Adj. Ring (H-L Orifice)	Brass
6 Upper Adj. Ring (M-Q Orifice)	Bronze
7 Upper Adj. Ring Pin	Brass
8 Yoke	Iron
9 Yoke Cap Screws (Not Shown)	Iron
10 Spindle Assembly (H-M Orifice)	
Spindle	Carbon Steel
Spindle Collar	Stainless Steel
10 Spindle Assembly (N-Q Orifice)	
Spindle Head	Carbon Steel
Spindle Stem	Carbon Steel
Roll Pin	Carbon Steel
11 Spring Washer	Carbon Steel
12 Spring	Chrome Alloy (Aluminum Metallized)
13 Compression Screw (H-N Orifice)	Brass
13 Compression Screw (P-Q Orifice)	Bronze
14 Compression Screw Nut (H-L Orifice)	Iron
14 Compression Screw Nut (M-P Orifice)	Brass
14 Compression Screw Nut (Q Orifice)	Bronze
15 Cap	Malleable Iron
16 Cap Set Screw	Brass
17 Lever (H-M Orifice)	Malleable Iron
18 Top Lever (N-Q Orifice)	Malleable Iron
19 Drop Lever (N-Q Orifice)	Malleable Iron
20 Release Nut (H-L Orifice)	Brass
20 Release Nut (M-Q Orifice)	Carbon Steel
21 Lever Pin (H-M Orifice)	Carbon Steel
22 Top Lever Pin (N-Q Orifice)	Carbon Steel
23 Drop Lever Pin (N-Q Orifice)	Carbon Steel
24 Spring Cover Option (not shown)	Carbon Steel
25 Cover Bolt (not shown)	Carbon Steel
26 Cover Nut (not shown)	Carbon Steel
27 Floating Washer (H, J, K only)	Carbon Steel

Note 1: Material for "J" orifice disc is brass.

Note 2: Stainless steel materials are available as an alternate for disc and seat bushing; select 1511\_S.



\*Notes:

1. When using the EVF-I or the Hydroset device 15", clearance is required.
2. When using the EVF-II, 17" clearance is required. When using the assisted closing device, an additional 8" clearance is required.

**Dimensions & Weights (USCS)**

Inlet Size	Valve Type	A in	B in	C in	D in	E in	Dismantling Height(in.)	Approximate Weight (lbs.)
1-1/2"	1511H	14-1/2	4-1/4	4	5-1/2	13/16	17-3/8	30
1-1/2"	1511J	14-1/2	4-1/4	4	5-1/2	13/16	17-3/8	36
2"	1511K	18-1/8	4-3/8	4-1/4	6-1/8	7/8	21-5/8	57
2-1/2"	1511L	19	5-1/2	5-1/4	7-1/4	1	22-5/8	79
3"	1511M	22-1/8	5-5/8	5-1/2	7-7/8	1-1/8	25-7/8	88
4"	1511N	24	6-3/4	7-1/4	8-5/8	1-1/4	27-1/2	142
4"	1511P	25-7/8	6-3/4	7-1/4	10-1/8	1-1/4	30	172
6"	1511Q	33-3/4	9-1/4	9	12-7/8	1-7/16	39-1/4	338

**Dimensions & Weights (metric)**

Inlet Size	Valve Type	A mm	B mm	C mm	D mm	E mm	Dismantling Height (mm)	Approximate Weight (kg)
1-1/2"	1511H	368.3	108.0	101.6	139.7	20.6	441.3	13.6
1-1/2"	1511J	368.3	108.0	101.6	139.7	20.6	441.3	16.3
2"	1511K	460.4	111.1	108.0	155.6	22.2	549.3	25.9
2-1/2"	1511L	482.6	139.7	133.4	184.2	25.4	574.7	35.8
3"	1511M	562.0	142.9	139.7	200.0	28.6	657.2	39.9
4"	1511N	609.6	171.5	184.2	219.1	31.8	698.5	64.4
4"	1511P	657.2	171.5	184.2	257.2	31.8	762.0	78.0
6"	1511Q	857.3	235.0	228.6	327.0	36.5	997.0	153.3

**ASME, B & PVC, Section I rating - 2001 Edition**  
**pounds per hour saturated steam at 3% overpressure or 2 psig,**  
**whichever is greater, 90% of actual capacity**

W=51.5KAP

K=.877

A= flow area in sq. in.

P= (1.03 x set pressure) + 14.7 or

P= (2 psig + set pressure) + 14.7

Not for use on superheated steam.

Review pressure/temperature limits

on page 1511.1.

**Orifice Designation & Discharge Area - Square Inches**

Orifice Designation Orifice Area (sq. in.) Set Pressure (psig)	H	J	K	L	M	N	P	Q
	0.785	1.287	1.840	2.853	3.600	4.340	6.380	11.050
15	1123	1842	2634	4084	5154	6213	9134	15820
20	1301	2133	3049	4729	5967	7193	10575	18316
25	1478	2423	3465	5373	6780	8173	12016	20811
30	1655	2714	3880	6017	7593	9154	13456	23306
35	1833	3005	4296	6661	8406	10134	14897	25802
40	2010	3295	4712	7306	9219	11114	16338	28297
45	2187	3586	5127	7950	10032	12094	17779	30793
50	2364	3877	5543	8594	10845	13074	19219	33288
55	2542	4167	5958	9239	11658	14054	20660	35783
60	2719	4458	6374	9883	12471	15034	22101	38279
65	2896	4749	6789	10527	13284	16014	23542	40774
70	3077	5045	7213	11184	14113	17014	25011	43320
75	3260	5344	7641	11848	14950	18023	26495	45890
80	3442	5644	8069	12512	15788	19033	27979	48460
85	3625	5943	8497	13175	16625	20042	29463	51030
90	3807	6242	8925	13839	17462	21052	30947	53601
95	3990	6542	9353	14502	18300	22061	32431	56171
100	4173	6841	9781	15166	19137	23071	33915	58741
105	4355	7141	10209	15830	19974	24080	35399	61311
110	4538	7440	10637	16493	20812	25090	36883	63882
115	4720	7739	11065	17157	21649	26099	38367	66452
120	4903	8039	11493	17820	22486	27109	39851	69022
125	5086	8338	11921	18484	23324	28118	41335	71592
130	5268	8637	12349	19148	24161	29128	42819	74163
135	5451	8937	12777	19811	24999	30137	44303	76733
140	5633	9236	13205	20475	25836	31147	45787	79303
145	5816	9535	13633	21139	26673	32156	47271	81873
150	5998	9835	14061	21802	27511	33166	48755	84444
155	6181	10134	14489	22466	28348	34175	50239	87014
160	6364	10433	14917	23129	29185	35185	51723	89584
165	6546	10733	15345	23793	30023	36194	53207	92154
170	6729	11032	15773	24457	30860	37204	54691	94725
175	6911	11332	16201	25120	31698	38213	56175	97295
180	7094	11631	16629	25784	32535	39223	57659	99865
185	7277	11930	17057	26447	33372	40232	59143	102435
190	7459	12230	17485	27111	34210	41242	60627	105006
195	7642	12529	17913	27775	35047	42251	62112	107576
200	7824	12828	18341	28438	35884	43261	63596	110146
205	8007	13128	18769	29102	36722	44270	65080	112716
210	8190	13427	19197	29766	37559	45280	66564	115287
215	8372	13726	19625	30429	38396	46289	68048	117857
220	8555	14026	20053	31093	39234	47299	69532	120427
225	8737	14325	20481	31756	40071	48308	71016	122997
230	8920	14625	20909	32420	40909	49318	72500	125568
235	9103	14924	21337	33084	41746	50327	73984	128138
240	9285	15223	21765	33747	42583	51337	75468	130708
245	9468	15523	22193	34411	43421	52346	76952	133278
250	9650	15822	22621	35074	44258	53356	78436	135849

**ASME, B & PVC, Section VIII rating - 2001 Edition**  
**pounds per hour saturated steam at 10% overpressure or 3 psig,**  
**whichever is greater, 90% of actual capacity**

W=51.5KAP

K= .877

A= flow area in sq. in.

P= (1.10 x set pressure) + 14.7 or

P= (3 psig + set pressure) + 14.7

Not for use on superheated steam.

Review pressure/temperature limits

on page 1511.1.

**Orifice Designation & Discharge Area - Square Inches**

Orifice Designation Orifice Area (sq. in.) Set Pressure (psig)	H 0.785	J 1.287	K 1.840	L 2.853	M 3.600	N 4.340	P 6.380	Q 11.050
15	1159	1900	2717	4213	5316	6409	9422	16319
20	1336	2191	3133	4857	6129	7389	10863	18815
25	1513	2482	3548	5502	6942	8369	12304	21310
30	1691	2772	3964	6146	7755	9350	13745	23806
35	1886	3092	4421	6855	8650	10428	15329	26550
40	2081	3412	4878	7563	9544	11506	16914	29295
45	2276	3731	5335	8272	10438	12584	18499	32040
50	2471	4051	5792	8981	11332	13662	20084	34785
55	2666	4371	6249	9690	12227	14740	21669	37530
60	2861	4690	6706	10398	13121	15818	23254	40275
65	3056	5010	7163	11107	14015	16896	24839	43020
70	3251	5330	7620	11816	14910	17974	26423	45765
75	3446	5650	8077	12524	15804	19052	28008	48510
80	3641	5969	8534	13233	16698	20131	29593	51255
85	3836	6289	8991	13942	17592	21209	31178	54000
90	4031	6609	9448	14651	18487	22287	32763	56745
95	4226	6928	9906	15359	19381	23365	34348	59490
100	4421	7248	10363	16068	20275	24443	35933	62235
105	4616	7568	10820	16777	21169	25521	37517	64980
110	4811	7887	11277	17485	22064	26599	39102	67724
115	5006	8207	11734	18194	22958	27677	40687	70469
120	5201	8527	12191	18903	23852	28755	42272	73214
125	5396	8847	12648	19612	24747	29833	43857	75959
130	5591	9166	13105	20320	25641	30912	45442	78704
135	5786	9486	13562	21029	26535	31990	47027	81449
140	5981	9806	14019	21738	27429	33068	48611	84194
145	6176	10125	14476	22446	28324	34146	50196	86939
150	6371	10445	14933	23155	29218	35224	51781	89684
155	6566	10765	15390	23864	30112	36302	53366	92429
160	6761	11085	15848	24573	31007	37380	54951	95174
165	6956	11404	16305	25281	31901	38458	56536	97919
170	7151	11724	16762	25990	32795	39536	58121	100664
175	7346	12044	17219	26699	33689	40614	59705	103409
180	7541	12363	17676	27407	34584	41693	61290	106154
185	7736	12683	18133	28116	35478	42771	62875	108898
190	7931	13003	18590	28825	36372	43849	64460	111643
195	8126	13322	19047	29534	37266	44927	66045	114388
200	8321	13642	19504	30242	38161	46005	67630	117133
205	8516	13962	19961	30951	39055	47083	69215	119878
210	8711	14282	20418	31660	39949	48161	70799	122623
215	8906	14601	20875	32368	40844	49239	72384	125368
220	9101	14921	21332	33077	41738	50317	73969	128113
225	9296	15241	21790	33786	42632	51395	75554	130858
230	9491	15560	22247	34495	43526	52474	77139	133603
235	9686	15880	22704	35203	44421	53552	78724	136348
240	9881	16200	23161	35912	45315	54630	80309	139093
245	10076	16519	23618	36621	46209	55708	81893	141838
250	10271	16839	24075	37329	47104	56786	83478	144583

## ASME, B & PVC, Section VIII rating - 2001 Edition

### Standard Cubic Feet per minute of Air (60°F) at 10% overpressure or 3 psig, whichever is greater

$W=18.331 \cdot A \cdot P \cdot K$

$K=.877$

A= flow area in sq. in.

$P= (1.10 \cdot \text{set pressure}) + 14.7$  or

$P= (3 + \text{set pressure}) + 14.7$

Not for use on superheated steam.

Review pressure temperature limits

on page 1511.1.

**1511 Capacity Table - Air at 10% Overpressure**

Set Pressure	Orifice Type & Discharge Area - Square Inches							
	H	J	K	L	M	N	P	Q
Psig	0.785	1.287	1.840	2.853	3.600	4.340	6.380	11.050
15	413	677	968	1501	1894	2283	3356	5812
20	476	780	1116	1730	2183	2632	3869	6701
25	539	884	1264	1960	2473	2981	4382	7590
30	602	987	1412	2189	2762	3330	4895	8478
35	672	1101	1575	2441	3081	3714	5460	9456
40	741	1215	1737	2694	3399	4098	6024	10434
45	811	1329	1900	2946	3718	4482	6589	11411
50	880	1443	2063	3199	4036	4866	7153	12389
55	950	1557	2226	3451	4355	5250	7717	13366
60	1019	1671	2388	3703	4673	5634	8282	14344
65	1088	1785	2551	3956	4992	6018	8846	15322
70	1158	1898	2714	4208	5310	6402	9411	16299
75	1227	2012	2877	4461	5629	6786	9975	17277
80	1297	2126	3040	4713	5947	7170	10540	18254
85	1366	2240	3202	4965	6266	7554	11104	19232
90	1436	2354	3365	5218	6584	7937	11668	20210
95	1505	2468	3528	5470	6903	8321	12233	21187
100	1575	2582	3691	5723	7221	8705	12797	22165
105	1644	2695	3854	5975	7540	9089	13362	23142
110	1713	2809	4016	6228	7858	9473	13926	24120
115	1783	2923	4179	6480	8177	9857	14491	25097
120	1852	3037	4342	6732	8495	10241	15055	26075
125	1922	3151	4505	6985	8814	10625	15620	27053
130	1991	3265	4667	7237	9132	11009	16184	28030
135	2061	3379	4830	7490	9451	11393	16748	29008
140	2130	3492	4993	7742	9769	11777	17313	29985
145	2200	3606	5156	7994	10088	12161	17877	30963
150	2269	3720	5319	8247	10406	12545	18442	31941
155	2339	3834	5481	8499	10724	12929	19006	32918
160	2408	3948	5644	8752	11043	13313	19571	33896
165	2477	4062	5807	9004	11361	13697	20135	34873
170	2547	4176	5970	9256	11680	14081	20700	35851
175	2616	4289	6133	9509	11998	14465	21264	36829
180	2686	4403	6295	9761	12317	14849	21828	37806
185	2755	4517	6458	10014	12635	15233	22393	38784
190	2825	4631	6621	10266	12954	15617	22957	39761
195	2894	4745	6784	10518	13272	16001	23522	40739
200	2964	4859	6946	10771	13591	16385	24086	41717
205	3033	4973	7109	11023	13909	16769	24651	42694
210	3102	5086	7272	11276	14228	17153	25215	43672
215	3172	5200	7435	11528	14546	17536	25779	44649
220	3241	5314	7598	11780	14865	17920	26344	45627
225	3311	5428	7760	12033	15183	18304	26908	46605
230	3380	5542	7923	12285	15502	18688	27473	47582
235	3450	5656	8086	12538	15820	19072	28037	48560
240	3519	5770	8249	12790	16139	19456	28602	49537
245	3589	5884	8412	13042	16457	19840	29166	50515
250	3658	5997	8574	13295	16776	20224	29731	51493