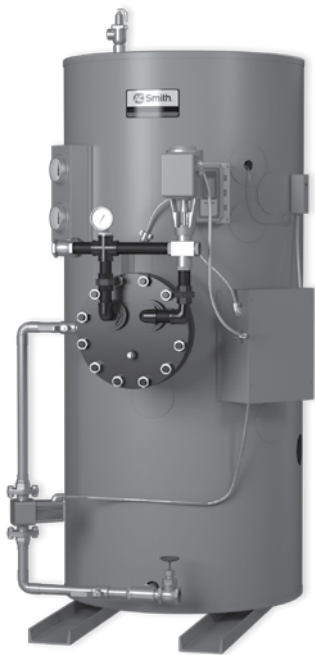


HWG PACKAGED HOT WATER GENERATING SYSTEMS

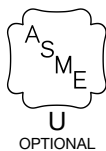
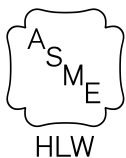
HWGV 120/200/250/300/400/500/650/750/1000

HWGH 250/300/400/500/600/700/1000



Hot water generators available for operation with steam or boiler water.

- Hot water generators are available in space saving vertical or horizontal models.
- Custom units built to order, with tank capacities up to 5,000 gallons, with special control trim, and with special heating units can be built to design specifications on special order basis. Standard units listed in this brochure cover most standard orders.
- All internal surfaces exposed to water are glasslined per ASME HLW procedures, using an NSF 61-approved glasslining compound
- Glass is highly resistant to effects of temperature, corrosion and electrolysis
- The HWG systems meet or exceed the thermal efficiency and standby loss requirements of the U.S. Department of Energy and current edition ASHRAE/IESNA 90.1.
- All hot water generators will employ an ASME "HLW" code glasslined storage tank fitted with an ASME "U" code 3/4" diameter copper tube heat exchanger.
- Tank circulator pump is factory supplied. The heat exchanger sizing tables are also based on using integral circulators.
- HWG consists of ASME HLW Code storage tank rated 125 psig working pressure with U Code heat exchanger, temperature & pressure relief valve, temperature & pressure gauge in tank, drain valve and lifting lugs.
- Tanks are fitted with oversized magnesium anodes with stainless steel core for improved durability
- Options for boiler water system:
 - Boiler water temperature gauge
 - Standard boiler water trim, includes 2-way temperature inlet y-strainer control valve, isolation valves
- Options for steam system:
 - Standard steam trim consists of temperature control valve, 1 steam trap on condensate line, inlet and outlet strainers
 - Electric operated valve
- Options for both boiler water and steam system:
 - Electronic control package
 - Electric high limit safety system, three-way controls with bypass
 - Low water cutoff, 12x16 vessel manway, 4x6 vessel hand hole
 - Hot water generators larger than 1000 gallons are available as HDJV or HDJH tanks with HWG features



SAMPLE SPECIFICATION - WATER TO WATER

The hot water heater generator package shall be A.O. Smith model no. HWG(V) or HWG(H), (ESW) or (EDW) with copper heating coil. The jacketed, insulated storage tank shall be constructed and stamped according to ASME specifications for (125) psi working pressure. The unit shall be designed to recover _____ GPH for a temperature of _____ degrees F to _____ degrees F when supplied with _____ GPM boiler water entering temperature regulator at _____ degrees F. The heating coil shall be constructed and stamped according to section VIII of ASME code. The tube bundles shall be constructed of 3/4" O.D. 20 GA. deoxidized drawn copper tubing. The unit shall be controlled by one of three means: On-Off Valve _____, Two Way Valve _____, Three Way Modulating Valve _____. The unit will be completely factory assembled and furnished with the following standard components.

A storage tank _____" dia. x _____" long with _____ gallon capacity. Tank shall be insulated to meet the R12.5 minimum thermal insulation requirements of the U.S. Department of Energy and current edition of ASHRAE/IESNA 90.1 Tank shall be jacketed with heavy gauge steel with a prepaint. Tank shall be built to ASME section lined and furnished with an ASME temperature & pressure relief valve. Heating coil built to Section VIII of ASME code. A temperature regulator to be self actuated, direct acting. A bronze integral circulator pump with copper soldered recirculation line and (2) bronze ball valves. A drain valve and assembly. Optional Jacket mounted temperature and pressure gauges, a CSA Certified and ASME Rated

SAMPLE SPECIFICATION - STEAM TO WATER

The hot water heater generator package shall be A. O. Smith model no. HWG(V) or HWG(H), (ESS) or (EDS) with copper heating coil. The jacketed, insulated storage tank shall be constructed and stamped according to ASME specifications for (125) psi working pressure. The unit shall be designed to recover _____ GPH for a temperature rise of _____ degrees F to _____ degrees F when supplied with _____ psi steam to the temperature regulator. The heating coil shall be constructed and stamped according to section VIII of ASME code. The tube bundles shall be constructed of 3/4" O.D. 20 GA. deoxidized drawn copper tubing. The unit will be completely factory assembled and furnished with the following standard components.

A storage tank _____" dia. x _____"long with _____gallon capacity. Tank shall be insulated to meet the R12.5 minimum thermal insulation requirements of the U.S. Department of Energy and current edition of ASHRAE/IESNA 90.1. Tank shall be jacketed with heavy gauge steel with a prepaint. Tank shall be built to ASME section IV, glasslined and furnished with an ASME temperature & pressure relief valve. Heating coil built to Section VIII of ASME code. A temperature regulator to be self actuated, direct acting. Main Steam trap, main "Y"strainer and associated black steel pipe. A bronze integral circulator pump with copper soldered recirculation line and (2) bronze ball valves. A drain valve and assembly. Optional Jacket mounted

To specify HWG series package water heater:

1. Calculate storage capacity in gallons required, and determine if vertical or horizontal installation applies.
2. Decide what type of heating medium will be used; steam or boiler water.
 - If steam - Determine steam pressure at steam control valve.
 - If boiler water - Determine available boiler water temperature.
3. From the recovery table, obtain the required GPH capacity and temperature rise. Selecting heating coil size.
4. Decide whether single or double wall coil is required.

Example installation requirements:

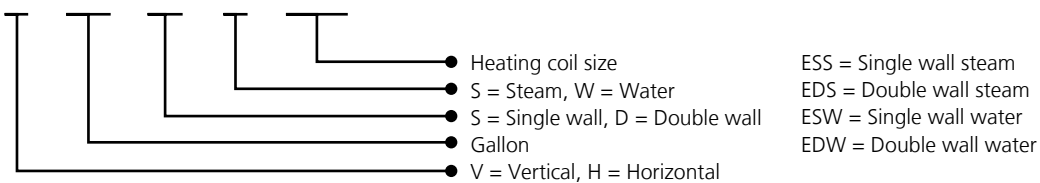
Vertical, 400 gallons, Steam @ 5 PSIG, 80 GPH Recovery, 40 - 140°F temperature rise.

To determine the HWG series model:

Storage Tank 400 Gallons, Vertical
Coil Size 418 (from RECOVERY CHART)

Model to specify

HWG - V 400A ES S 4-18



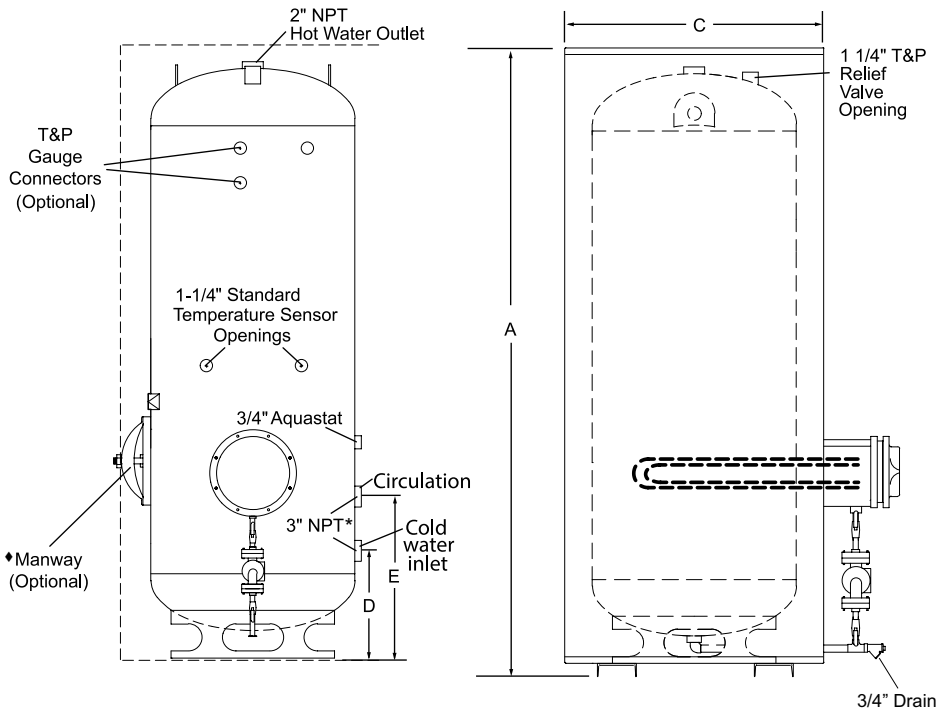
Vertical tanks round jacketed

Model	A	C	D	E	Gallon
HWGV-120A	63	28	10	16	120
HWGV-200A	77.25	32	11.25	17.25	200
HWGV-250A	91	34	18	26	257
HWGV-300A	80	40	19.5	27.5	318
HWGV-400A	80	46	21	29	432
HWGV-500A	92	46	21	29	504
HWGV-650A	92	52	23.5	31.5	650
HWGV-750A	104	52	23.5	31.5	752
HWGV-1000A	128	52	23.5	31.5	940

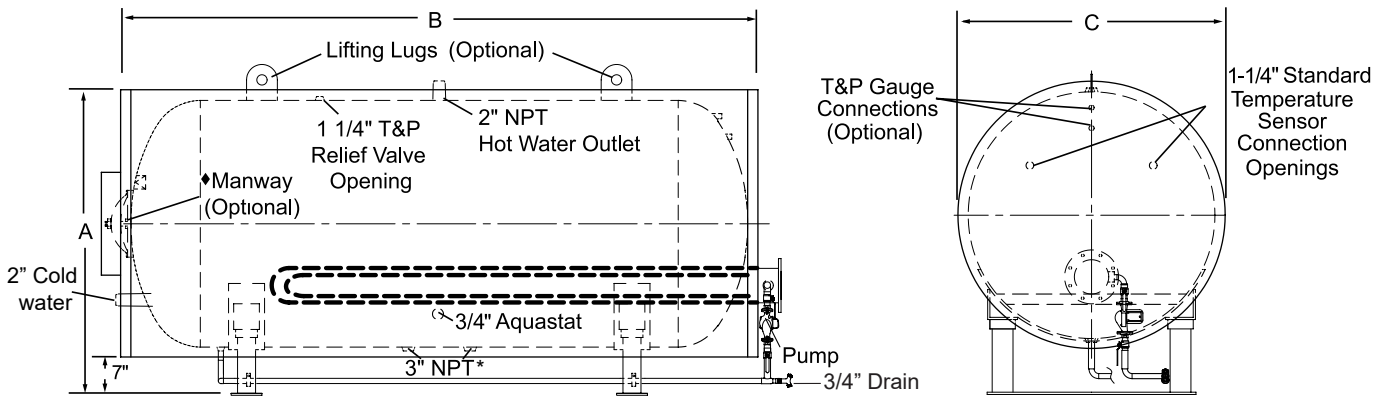
Note: consult factory for design parameters outside this chart

Horizontal tanks round jacketed

Model	A	B	C	Gallon
HWGH-250A	41	87	34	250
HWGH-300A	47	76	40	300
HWGH-400A	53	76	46	400
HWGH-500A	53	88	46	500
HWGH-600A	59	88	52	600
HWGH-700A	59	100	52	700
HWGH-1000A	59	124	52	1000



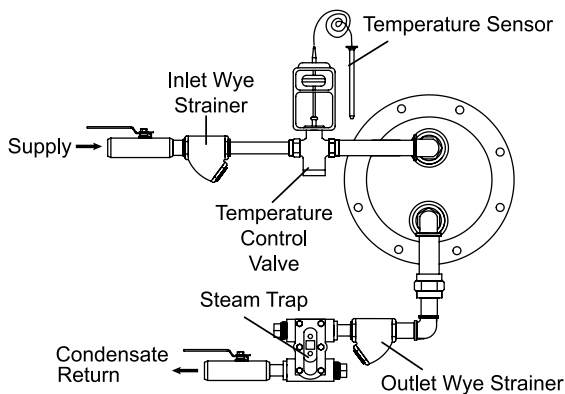
- The HWGV 120A to 300A and HWGH 250A to 300A models have 2 inspection openings of 2 inch each.
- Man holes are optional on the 250A and 300A models.
- HWGV/HWGH 400A to 1000A models have a 12x16 inch man hole.



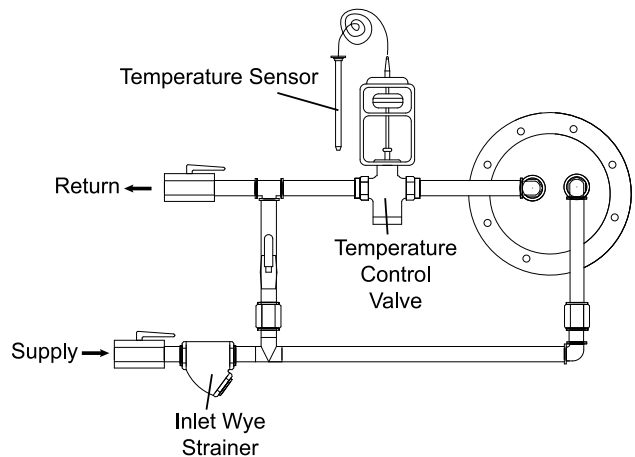
*2" on 120; 2-1/2" on 200 Gal.

Steam to water optional control package

Water to water optional control package



Left hand or right hand configurations available.



For electric controls, contact factory.

Select coil model based on boiler water temperature and required water temperature rise

Model number	180°F boiler water						200°F boiler water						210°F boiler water					
	GPH @40-120°F	GPM BW	GPH @40-140°F	GPM BW	GPH @40-160°F	GPM BW	GPH @40-120°F	GPM BW	GPH @40-140°F	GPM BW	GPH @40-160°F	GPM BW	GPH @40-120°F	GPM BW	GPH @40-140°F	GPM BW	GPH @40-160°F	GPM BW
Four inch diameters																		
418	73	4	48	4	27	2	93	6	57	4	43	4	101	6	72	6	51	5
424	98	6	64	5	36	3	124	8	76	6	58	5	135	9	96	8	68	6
430	123	8	80	6	45	4	155	10	96	8	72	7	18	11	120	10	85	8
436	147	9	96	8	54	5	186	12	115	9	87	8	202	18	192	16	136	13
448	197	13	128	10	72	7	248	16	153	12	116	11	270	18	192	16	136	13
Six inch diameters																		
618	166	11	108	9	61	6	209	13	129	10	98	9	227	15	162	13	115	11
624	212	14	138	11	78	7	267	17	165	13	125	12	291	19	207	17	147	14
630	261	17	170	14	96	9	329	21	204	17	154	15	358	23	255	21	181	18
636	304	20	198	16	112	11	384	25	237	19	180	18	417	27	297	24	211	21
648	403	26	262	21	149	14	508	33	314	26	238	23	552	36	393	32	280	28
660	498	33	324	27	184	18	628	41	388	32	294	29	683	45	486	40	346	34
Eight inch diameters																		
824	429	28	279	23	159	15	541	36	334	27	253	25	588	39	418	34	298	29
630	543	36	353	29	201	20	684	45	423	35	321	32	744	49	529	44	377	37
836	657	43	427	35	243	24	828	55	512	42	388	38	900	60	640	53	456	45
842	770	51	500	41	285	28	970	64	600	50	455	45	1,055	70	750	62	535	53
848	862	57	560	46	319	31	1,086	72	672	56	509	50	1,181	78	840	70	599	59
860	1,008	67	655	54	373	37	1,270	84	786	65	596	59	1,382	92	982	81	700	70
Ten inch diameters																		
1030	1,062	70	690	57	393	39	1,338	89	828	69	627	62	1,455	97	1,035	86	738	73
1036	1,262	84	820	68	467	46	1,590	106	984	82	746	74	1,730	115	1,230	102	877	87
1042	1,487	99	966	80	550	55	1,874	124	1,159	96	879	87	2,038	135	1,449	120	1,033	103
1048	1,724	114	1,120	93	638	63	2,172	144	1,344	112	1,019	101	2,363	157	1,680	140	1,198	119
1060	2,152	143	1,398	116	796	79	2,712	180	1,677	139	1,272	127	2,949	196	2,097	174	1,495	149
1072	2,571	171	1,670	139	951	95	3,239	215	2,004	167	1,519	151	3,523	234	2,505	208	1,786	178
Twelve inch diameters																		
1236	1,449	116	1,136	94	647	64	2,203	146	1,363	113	1,033	103	2,396	159	1,704	142	1,215	121
1242	2,060	137	1,338	111	762	76	2,595	173	1,605	133	1,217	121	2,823	188	2,007	167	1,431	143
1248	2,371	158	1,540	128	877	87	2,987	199	1,848	154	1,401	140	3,249	216	2,310	192	1,647	164
1254	2,682	17	1,742	145	992	99	3,379	225	2,090	174	1,585	158	3,675	245	2,613	217	1,863	186
1260	2,993	199	1,944	162	1,108	110	3,771	251	2,332	194	1,769	176	4,101	273	2,916	243	2,080	208
1272	3,615	241	2,348	195	1,338	133	4,555	303	2,817	234	2,136	213	4,954	330	3,522	293	2,512	251
Fourteen inch diameters																		
1436	2,363	157	1,535	127	874	87	2,977	138	1,842	153	1,396	139	3,238	215	2,302	191	1,942	164
1442	2,767	184	1,797	147	1,024	102	3,486	232	2,156	179	1,635	163	3,791	252	2,695	224	1,922	192
1448	3,172	211	2,060	171	1,174	117	3,996	266	2,472	206	1,874	187	4,346	289	3,090	257	2,204	220
1454	3,588	239	2,330	194	1,328	132	4,520	301	2,796	233	2,120	237	4,916	327	3,495	291	2,493	249
1460	4,011	267	2,605	217	1,484	148	5,053	336	3,126	260	2,370	237	5,496	366	3,907	325	2,787	278
1472	4,804	320	3,120	260	1,778	177	6,052	403	3,744	312	2,839	283	6,583	438	4,680	390	3,338	333

Select coil model based on steam pressure and required water temperature rise

Model number	5 PSI steam						15 PSI steam					
	GPH @ 40-120°F	PPH steam	GPH @ 40-140°F	PPH steam	GPH @ 40-160°F	PPH steam	GPH @ 40-120°F	PPH steam	GPH @ 40-140°F	PPH steam	GPH @ 40-160°F	PPH steam
Four inch diameters												
418	152	105	119	102	91	95	171	119	139	121	109	114
424	202	140	158	137	122	126	229	159	186	162	145	152
430	253	175	198	171	152	158	286	199	232	203	182	191
436	304	210	238	205	183	190	343	239	279	243	218	229
448	405	280	317	274	244	253	458	319	372	325	291	305
Six inch diameters												
618	342	236	267	231	206	213	386	269	314	274	246	257
624	437	302	342	295	263	273	494	344	401	350	314	329
630	538	372	421	364	324	336	608	424	494	431	387	405
636	627	433	491	424	378	391	708	494	576	502	451	472
648	830	573	649	561	500	518	937	655	762	665	597	625
660	1027	709	803	693	618	641	1,159	809	642	822	738	773
Eight inch diameters												
824	884	611	691	597	532	552	998	697	811	708	636	666
830	1,119	773	875	756	674	698	1,263	882	1,027	896	804	842
836	1,353	935	1,058	914	815	845	1,528	1,067	1,242	1,084	973	1,019
842	1,585	1,095	1,240	1,070	955	989	1,790	1,249	1,455	1,269	1,140	1,193
848	1,775	1,226	1,388	1,199	1,069	1,108	2,004	1,399	1,629	1,422	1,276	1,337
860	2,076	1,434	1,624	1,402	1,251	1,296	2,344	1,673	1,906	1,663	1,493	1,563
Ten inch diameters												
1030	2,187	1,511	1,711	1,477	1,317	1,365	2,470	1,724	2,007	1,752	1,573	1,649
1036	2,599	1,795	2,033	1,756	1,566	1,623	2,935	2,049	2,386	2,082	1,869	1,957
1042	3,062	2,115	2,395	2,069	1,845	1,912	3,458	2,414	2,811	2,453	2,202	2,306
1048	3,550	2,453	2,777	2,398	2,139	2,217	4,009	2,799	3,259	2,844	2,553	2,674
1060	4,431	3,061	3,467	2,994	2,670	2,767	5,004	3,494	4,068	3,550	3,187	3,338
1072	5,293	3,657	4,141	3,576	3,189	3,305	5,978	4,174	4,859	4,241	3,807	3,987
Twelve inch diameters												
1236	3,601	2,488	2,817	2,433	2,169	2,248	4,066	2,839	3,305	2,884	2,590	2,712
1242	4,241	2,930	3,318	2,865	2,555	2,648	4,790	3,344	3,896	3,397	3,050	3,194
1248	4,881	3,372	3,819	3,298	2,941	3,048	5,513	3,849	4,481	3,910	3,511	3,677
1254	5,522	3,815	4,320	3,731	3,327	3,448	6,236	4,354	5,069	4,423	3,971	4,159
1260	6,162	4,257	4,821	4,163	3,713	3,848	6,959	4,858	5,657	4,936	4,432	4,641
1272	7,443	5,142	5,823	5,029	4,484	4,647	8,405	5,868	6,832	5,962	5,353	5,606
Fourteen inch diameters												
1436	4,865	3,362	3,806	3,287	2,931	3,038	5,495	3,836	4,466	3,898	3,499	3,665
1442	5,696	3,935	4,456	3,848	3,432	3,557	6,433	4,491	5,229	4,563	4,097	4,290
1448	6,530	4,511	5,108	4,412	3,934	4,077	7,374	5,148	5,994	5,231	4,696	4,918
1454	7,386	5,103	5,778	4,990	4,450	4,612	8,341	5,823	6,780	5,917	5,312	5,563
1460	8,257	5,705	6,460	5,579	4,975	5,156	9,325	6,511	7,580	6,615	5,939	6,220
1472	9,890	6,833	7,737	6,682	5,959	6,176	11,169	7,798	9,079	7,923	7,113	7,449

Select coil model based on steam pressure and required water temperature rise

Model number	25 PSI steam						50 PSI steam					
	GPH @ 40-120°F	PPH steam	GPH @ 40-140°F	PPH steam	GPH @ 40-160°F	PPH steam	GPH @ 40-120°F	PPH steam	GPH @ 40-140°F	PPH steam	GPH @ 40-160°F	PPH steam
Four inch diameters												
418	188	132	156	137	121	128	213	153	187	167	145	156
424	250	176	208	183	162	171	284	204	249	223	193	208
430	313	220	260	228	203	214	356	255	312	279	242	260
436	376	265	312	274	243	257	427	306	374	335	290	312
448	501	353	16	366	325	343	569	408	499	447	387	416
Six inch diameters												
618	423	298	351	309	274	289	480	344	421	377	327	351
624	540	381	448	394	350	370	614	440	538	482	418	449
630	666	666	552	486	431	456	756	542	663	594	515	553
636	776	546	643	566	502	531	881	631	772	691	599	645
648	1,027	723	851	749	665	703	1,165	835	1,021	915	793	853
660	1,270	894	1,053	927	822	869	1,441	1,033	1,263	1,132	981	1,055
Eight inch diameters												
824	1,093	770	906	798	708	748	1,241	889	1,088	974	845	908
830	1,383	974	1,147	1,010	896	947	1,570	1,125	1,376	1,233	1,069	1,150
836	1,673	1,179	1,387	1,121	1,084	1,146	1,900	1,362	1,665	1,492	1,293	1,391
842	1,960	1,380	1,625	1,430	1,270	1,341	2,225	1,594	1,950	1,747	1,515	1,628
848	2,195	1,546	1,820	1,602	1,422	1,502	2,492	1,786	2,184	1,956	1,969	1,824
860	2,567	1,808	2,128	1,874	1,663	1,757	2,914	2,089	2,554	2,288	1,984	2,133
Ten inch diameters												
1030	2,704	1,905	2,242	1,974	1,752	1,851	3,070	2,200	2,691	2,411	2,090	2,247
1036	3,214	2,264	2,665	2,346	2,082	2,200	3,649	2,615	3,198	2,865	2,484	2,671
1042	3,786	2,667	3,139	2,764	2,453	2,592	4,298	3,081	3,767	3,375	2,926	3,147
1048	4,390	3,092	3,640	3,205	2,844	3,005	4,984	3,572	4,368	3,913	3,393	3,648
1060	5,480	3,860	4,543	4,000	3,500	3,752	6,221	4,459	5,452	4,885	4,235	4,554
1072	6,546	4,611	5,427	4,779	4,241	4,482	7,431	5,327	6,513	5,835	5,060	5,440
Twelve inch diameters												
1236	4,453	3,136	3,692	3,250	2,885	3,048	5,055	3,623	4,430	3,969	3,442	3,700
1242	5,244	3,695	4,348	3,829	3,398	3,591	5,954	4,267	5,218	4,675	4,054	4,358
1248	6,036	4,252	5,005	4,407	3,911	4,133	6,853	4,912	6,006	5,381	4,666	5,017
1254	6,828	4,810	5,661	4,985	4,424	4,675	7,751	5,556	6,793	6,087	5,278	5,675
1260	7,620	5,368	6,318	5,563	4,937	5,217	8,650	6,200	7,581	6,793	5,890	6,333
1272	9,204	6,483	7,631	6,719	5,963	6,301	10,448	7,489	9,157	8,204	7,114	7,649
Fourteen inch diameters												
1436	6,017	4,238	4,922	4,392	3,898	4,119	6,830	4,896	5,956	5,363	4,651	5,000
1442	7,044	4,962	5,840	5,142	4,564	4,822	7,996	5,731	7,008	6,279	5,444	5,854
1448	8,075	5,688	6,695	5,895	5,232	5,528	9,167	6,570	8,034	7,198	6,241	6,711
1454	9,133	6,434	7,572	6,667	5,918	6,253	10,368	7,432	9,087	8,141	7,059	7,590
1460	10,211	7,193	8,466	7,454	6,616	6,991	11,592	8,309	10,159	9,102	7,893	8,486
1472	12,230	8,615	10,140	8,925	7,924	8,373	13,884	9,951	12,168	10,902	9,453	10,164