

Flo-Rite-Temp™ Instantaneous Steam/Water Heater Stainless Steel Sizing Chart



Capacities and Steam Loads																				
Inlet Temp. °F	Set Temp. °F	Standard								Inlet Temp. °C	Set Temp. °C	Metric								Model
		Hot Water Capacities*				Steam Capacities						Hot Water Capacities*				Steam Capacities				
		Steam Pressure										Steam Pressure								
		psig										psig								
		2	5	10	15	2	5	10	15			0.14	0.35	0.7	1	0.14	0.35	0.7	1	
		gpm				lb/hr						m ³ /h				kg/hr				
40	120	41	44	47	51	1,695	1,821	1,993	2,138	4	49	9.3	10	10.7	11.6	769	826	904	970	665 SS
		84	89	97	103	3,351	3,720	4,100	4,368			19.1	20.2	22	23.4	1,520	1,687	1,860	1,981	8120 SS
	130	35	37	41	43	1,617	1,743	1,915	2,061		54	7.9	8.4	9.3	9.8	733	791	869	935	665 SS
		66	72	80	86	2,974	3,239	3,611	3,956			15	16.4	18.2	19.5	1,349	1,469	1,638	1,794	8120 SS
	140	30	32	35	37	1,535	1,662	1,836	1,982		60	6.8	7.3	7.9	8.4	696	754	833	899	665 SS
		52	57	64	71	2,596	2,862	3,216	3,540			11.8	12.9	14.5	16.1	1,178	1,298	1,459	1,606	8120 SS
	160	17	18	19	21	1,011	1,110	1,242	1,353		71	3.9	4.1	4.3	4.8	459	503	563	614	665 SS
		44	48	53	57	2,726	2,990	3,346	3,646			10	10.9	12	12.9	1,237	1,356	1,518	1,654	8120 SS
	180	12	13	15	17	860	964	1,103	1,217		82	2.7	3	3.4	3.9	390	437	500	552	665 SS
		32	35	40	44	2,316	2,598	2,971	3,280			7.3	7.9	9.1	10	1,051	1,178	1,348	1,488	8120 SS
50	120	45	48	53	56	1,643	1,768	1,938	2,083	10	49	10.2	10.9	12	12.7	745	802	879	945	665 SS
		91	97	105	113	3,300	3,550	3,892	4,183			20.7	22	23.8	25.7	1,497	1,610	1,765	1,897	8120 SS
	130	38	41	44	47	1,566	1,691	1,862	2,007		54	8.6	9.3	10	10.7	710	767	845	910	665 SS
		75	81	89	95	2,997	3,257	3,740	4,031			17	18.4	20.2	21.6	1,359	1,477	1,696	1,828	8120 SS
	140	32	34	38	41	1,486	1,612	1,784	1,930		60	7.3	7.7	8.6	9.3	674	731	809	875	665 SS
		58	64	71	79	2,628	2,867	3,212	3,558			13.2	14.5	16.1	17.9	1,192	1,300	1,457	1,614	8120 SS
	160	17	19	21	23	978	1,075	1,206	1,316		71	3.9	4.3	4.8	5.2	444	488	547	597	665 SS
		46	51	56	61	2,635	2,896	3,249	3,545			10.4	11.6	12.7	13.9	1,195	1,314	1,474	1,608	8120 SS
	180	12	14	16	18	830	933	1,070	1,183		82	2.7	3.2	3.6	4.1	376	423	485	537	665 SS
		33	37	42	47	2,235	2,513	2,882	3,188			7.5	8.4	9.5	10.7	1,014	1,140	1,307	1,446	8120 SS
60	120	51	55	60	64	1,590	1,713	1,883	2,027	16	49	11.6	12.5	13.6	14.5	721	777	854	919	665 SS
		71	104	122	130	3,247	3,500	3,846	4,139			16.1	23.6	27.7	29.5	1,473	1,588	1,745	1,877	8120 SS
	130	42	45	49	53	1,514	1,639	1,808	1,952		54	9.5	10.2	11.1	12	687	743	820	885	665 SS
		86	92	100	108	3,093	3,347	3,694	3,988			19.5	20.9	22.7	24.5	1,403	1,518	1,676	1,809	8120 SS
	140	35	37	41	44	1,436	1,561	1,732	1,876		60	7.9	8.4	9.3	10	651	708	786	851	665 SS
		66	73	81	87	2,620	2,903	3,233	3,703			15	16.6	18.4	19.8	1,188	1,317	1,466	1,680	8120 SS
	160	18	20	22	24	943	1,040	1,170	1,279		71	4.1	4.5	5	5.5	428	472	531	580	665 SS
		49	54	60	65	2,543	2,801	3,151	3,445			11.1	12.3	13.6	14.8	1,154	1,271	1,429	1,563	8120 SS
	180	13	14	17	19	799	901	1,035	1,148		82	3	3.2	3.9	4.3	362	409	469	521	665 SS
		35	39	44	49	2,152	2,427	2,791	3,093			7.9	8.9	10	11.1	976	1,101	1,266	1,403	8120 SS

*Units may be piped in parallel when desired capacities exceed that of a single unit.

NOTES: Minimum water temperature increase is 60°F (33°C). Consult factory if less than 60°F (33°C) increase is required or a set temperature of below 120°F (49°C) is required.



ASHRAE Modified Hunter Curve - Fixture Units

140°F Temperature From Heater						
Hospital		Restaurant**		Factory		
Type of Fixture	Fix. Units	Type of Fixture	Fix. Units	Type of Fixture	Fix. Units	
Private Lavatory	.75	Private Lavatory	.70	Private Lavatory	.75	
Public Lavatory	1.0	Public Lavatory	2.0	Public Lavatory	1.0	
Semi-Private Lavatory	1.2	†Private Shower	1.5	†Private Shower	1.5	
†Private Shower	1.5	†Public Shower	1.7	†Public Shower	3.0	
†Ward Shower	2.5	Sink - Kitchen	3.0	Sink - Slop	2.5	
†Semi-Private Shower	1.5	Sink - Pantry	2.5	36" Half Bradley	1.0	
Private Bath	1.5	Sink - Slop	2.0	36" Full Bradley	1.5	
Ward Bath	2.0	Sink - Pot (Single)	2.5	54" Half Bradley	1.5	
Sink - Flushing Rim	2.0	Sink - Pot (Double)	3.5	54" Full Bradley	2.0	
Sink - Scrub-Up	1.5	Sink - Pot (Triple)	5.5	Correctional or Mental Institution		
Sink - Laboratory	1.5	Sink - Vegetable	2.0			
Sink - General Purpose	1.0	Sink - Bar	2.5			
Bath - Leg	6.0	Washer - Silver	2.0*			
Bath - Arm	4.0	Washer - Glass	2.0*	Type of Fixture	Fix. Units	
Bath - Sitz	3.0	Washer - Can	3.0	Private Lavatory	.70	
Bath - Foot	3.0	Coffee Urn	1.2	Public Lavatory	1.0	
Bath - Emergency	2.0	Bain Marie	1.0	†Private Shower	1.5	
Hydrotherapeutic Showers		Pot and Pan Washer	2.0*	†Public Shower	3.0	
#1 Shower Head	8.0	Dish Pre-Rinse	2.5	†Tub and Shower	1.5	
#2 Spray	12.0	Pre-Scraper	2.0	Sink - Slop	2.0	
Continuous Flow Bath		Pre-Scraper Conveyor	2.5	Janitor Drop	2.0	
Continuous Flow Fill	2.0	36" Half Bradley	1.0	36" Half Bradley	1.0	
Continuous Flow Operate	1.5	36" Full Bradley	1.5	36" Full Bradley	1.5	
Hubbard	4.0	*Dishwashers (use booster to heat from 140° to 180°F)		54" Half Bradley	1.5	
Autopsy Table	2.0			54" Full Bradley	2.0	
Autopsy Sink and Table	2.5			Apartment		
Club						
Type of Fixture	Fix. Units	Type of Fixture	Fix. Units	Type of Fixture	Fix. Units	
Private Lavatory	.75	Single Tank - Stationary Rack		Private Lavatory	.75	
Public Lavatory	1.0	16 x 16 Rack	2.5	Public Lavatory	1.0	
†Private Shower	1.5	18 x 18 Rack	3.9	†Private Shower	1.5	
†Public Shower	1.7	20 x 20 Rack	4.2	†Public Shower	1.5	
†Tub and Shower	1.5	Multiple Tank Conveyor Type		†Tub and Shower	1.5	
Sink - Slop	2.5	Dishes - Inclined	2.0	Sink - Kitchen	.75	
36" Half Bradley	1.0	Dishes - Flat	2.5	Sink - Slop	1.5	
36" Full Bradley	1.5	Single Tank Conveyor Type	2.3	Sink - Pantry	1.5	
54" Half Bradley	1.5	Hotel - Motel		Domestic Clothes Washer	1.2	
50" Full Bradley	2.0			Domestic Dishwasher	1.5	
Gymnasium				Laundry Tray	1.5	
				Private - Public School		
Type of Fixture	Fix. Units	Type of Fixture	Fix. Units		Type of Fixture	Fix. Units
Private Lavatory	.75	Private Lavatory	.75	Private Lavatory	.75	
Public Lavatory	1.0	Public Lavatory	1.0	Public Lavatory	1.0	
Private Shower	1.5	†Private Shower	1.5	†Private Shower	1.5	
Public Shower	3.0	†Tub and Shower	1.5	†Tub and Shower	1.5	
Sink - Slop	1.5	Basin - Barber	2.0	†Tub and Shower	1.7	
Basin - Foot	1.2	Sink - Slop	2.5	Sink - Slop	2.5	
36" Half Bradley	1.0	Basin - Beauty Parlor	2.5	Janitor Drop	1.5	
36" Full Bradley	1.5	Office Building		Domestic Clothes Washer	2.0	
54" Half Bradley	1.5			Domestic Dishwasher	2.0	
54" Full Bradley	2.0			Institution - Home		
Assoc. Bldg. YMCA						
Type of Fixture	Fix. Units	Type of Fixture	Fix. Units	Type of Fixture	Fix. Units	
Private Lavatory	.75	Private Lavatory	.75	Private Lavatory	.70	
Public Lavatory	1.0	Public Lavatory	1.0	Public Lavatory	1.0	
†Private Shower	1.5	Private Shower	1.5	†Private Shower	1.5	
†Tub and Shower	1.7	Sink - Slop	2.5	†Tub and Shower	1.5	
Sink - Slop	2.5	Janitor Drop	2.5	†Tub and Shower	1.5	
Janitor Drop	2.0	Sink - Slop	1.0	Sink - Slop	2.0	
		36" Half Bradley	1.0	Sink - Slop	2.0	
		36" Full Bradley	1.5	Janitor Drop	2.0	

*These items require 180°F hot water. The consumption figures are based on supplying 140°F water with a booster heater used to obtain 180°F water.
 **Add 20% to all figures when not used in combination with other building services from same heater.
 †The fixture units listed for shower heads are based on a flow rate of 3 gpm. These units should be corrected for other flow rates. Multiply the fixture units by Correction Factor "C" from the formula: C = G x .33, where C = Correction Factor and G = gpm of shower head being used. Example: Shower head 4 gpm = C = 4 x .33 or 1.32. From Fixture Units Table, Hotel-Motel (shower) which shows 1.5 fixture units, multiply 1.5 x 1.32 = 2.10 fixture units per shower head using 4 gpm.

ASHRAE Modified Hunter Curve - Flow Charts



Chart 39-1

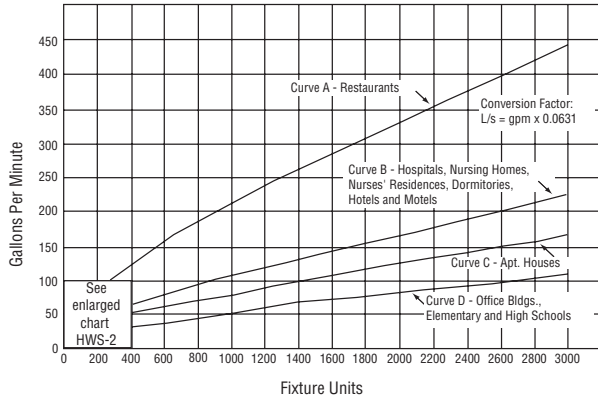
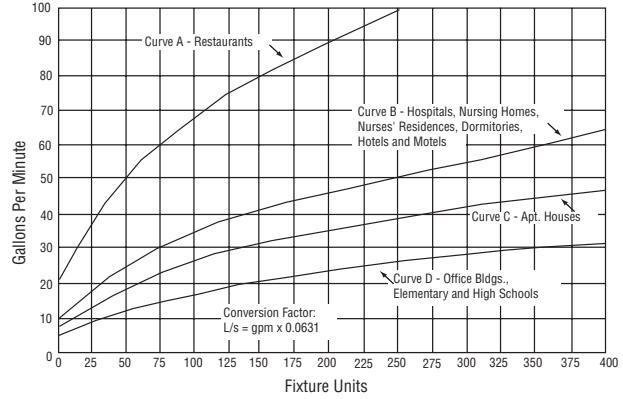


Chart 39-2. Enlarged Section



Reprinted from the 1987 ASHRAE *Handbook-HVAC* with permission from the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. Hunter curves should be used for intermittent, insignificant fixtures only.

Step 1

Determine the total fixture unit load for all the fixtures serviced by your water heater application using the Fixture Units Table on page 38. See example below.

Step 2

Using the total fixture units for your application, enter the Hunter Curves (Chart 39-1) from the bottom on the total fixture units line for your application. Read up to the curve that best fits the application. Then read to the left for the corresponding gpm requirement.

Step 3

Select the proper Armstrong Water Heater/Water Temperature Controller.

Example: College Dormitory

No. Fixtures	Type of Fixture	Fix. Unit	Demand Fix. Unit
150	Private Lavatory	.75	113
120	Private Shower	1.5	180
20	Slop Basin	2.5	50
8	Clothes Washer	2.0	16
Total Fixture Units			359

Refer to the modified Hunter Curves in Chart 39-2. Curve B represents dormitories. Enter the graph from the bottom at 359 fixture units and go up to curve B. Then move to the left horizontally to read approximately 60 gallons per minute of hot water capacity required. NOTE: Remember to add any constant flow capacities, as determined under "Important Note" below, to this 60 gpm.

Important Note

Special consideration should be given to applications involving periodic use of gang showers, process equipment, laundry machines, etc., as may occur in field houses, gymnasiums, factories, hospitals, etc. Because these applications could have all equipment on at the same time, their total hot water capacity should be determined and then added to the maximum hot water demand as read from the modified Hunter Curves. Use the following formula to determine total hot water capacity needed for these applications when final water temperatures are lower than that of the water heater.

$$\frac{(B - C)}{(H - C)} \times \left(\text{Total water flow from all gang shower heads in gpm} \right) = \text{Hot water needed (gpm)}$$

Where:

- B = Blended water temperature out of the fixture
- H = Hot water temperature to the fixture
- C = Cold water temperature to the fixture