

Technical Tables

Temperature Conversion Table

°C	°F
1	33.8
5	41.0
10	50.0
15	59.0
20	68.0
25	77.0
30	86.0
35	95.0
40	104.0
45	113.0
50	122.0
55	131.0
60	140.0
65	149.0
70	158.0
75	167.0
80	176.0
85	185.0
90	194.0
95	203.0
100	212.0

Pressure Conversion Table

Head Feet	Pressure lb/in ²	Head Feet	Pressure lb/in ²	Head Feet	Pressure lb/in ²	Head Feet	Pressure lb/in ²
1	0.4	26	11.3	51	22.1	76	32.9
2	0.9	27	11.7	52	22.5	77	33.4
3	1.3	28	12.1	53	23.0	78	33.8
4	1.7	29	12.6	54	23.4	79	34.2
5	2.2	30	13.0	55	23.8	80	34.7
6	2.6	31	13.4	56	24.3	81	35.1
7	3.0	32	13.9	57	24.7	82	35.5
8	3.5	33	14.3	58	25.1	83	36.0
9	3.9	34	14.7	59	25.6	84	36.4
10	4.3	35	15.2	60	26.0	85	36.8
11	4.8	36	15.6	61	26.4	86	37.3
12	5.2	37	16.0	62	26.9	87	37.7
13	5.6	38	16.5	63	27.3	88	38.1
14	6.1	39	16.9	64	27.7	89	38.6
15	6.5	40	17.3	65	28.2	90	39.0
16	6.9	41	17.8	66	28.6	91	39.4
17	7.4	42	18.2	67	29.0	92	39.9
18	7.8	43	18.6	68	29.5	93	40.3
19	8.2	44	19.1	69	29.9	94	40.7
20	8.7	45	19.5	70	30.3	95	41.2
21	9.1	46	19.9	71	30.8	96	41.6
22	9.5	47	20.4	72	31.2	97	42.0
23	10.0	48	20.8	73	31.6	98	42.5
24	10.4	49	21.2	74	32.1	99	42.9
25	10.8	50	21.7	75	32.5	100	43.4

Hot Water Recovery Chart

Loading Kilowatts	Litres Of Water															
	5	7	10	15	30	60	80	100	150	200	250	300	400	600	800	1000
1.0	18	25	35	55	105	210	280									
2.0	9	13	18	27	55	105	140	175	265							
3.0	6	9	12	18	35	70	95	120	175	235	295					
4.0	5	7	9	14	27	55	70	90	135	175	220	265				
6.0	3	5	6	9	18	35	50	60	90	120	150	175	235	350	470	585
8.0	3	4	5	7	14	27	35	45	70	90	110	135	185	265	350	440
9.0	2	3	4	6	12	24	31	49	60	80	100	120	160	235	315	390
12.0	2	2	3	5	9	18	24	30	45	60	75	90	120	175	235	295
15.0	2	2	3	4	7	14	19	24	35	50	60	70	95	140	190	235

Technical Tables

Rec. Hot Water Requirements

- **HANDWASHING** 1 to 2.5 litres per person (40°C)
- **KITCHEN SINK** 2 to 7 litres per person (60°C)
- **CLEANING** 10 litres per day (60°C)
- **BATH** 60 litres per bath (60°C)
- **HAIRDRESSING** 10 litres per shampoo (40°C)
- **DISHWASHER** 2 litres per meal (60°C)

Standard Formulae

LOADING CALCULATIONS (excluding Heat Losses)

$$\text{Time in Minutes to heat water} = \frac{\text{Litres x Temp Rise } ^\circ\text{C}}{\text{kW loading x 14.3}}$$

$$= \frac{\text{Gallons x Temp Rise } ^\circ\text{F}}{\text{kW loading x 5.7}}$$

$$\text{kW loading required} = \frac{\text{Litres x Temp Rise } ^\circ\text{C}}{\text{Time in minutes x 14.3}}$$

$$= \frac{\text{Gallons x Temp Rise } ^\circ\text{F}}{\text{Time in minutes x 5.7}}$$

Physical Constants

- Length** 1m = 3.28ft
1ft = 30.8 cm
- Volume** 1gal = 4.54 litres
= 277 cu. ins.
= 10 lbs (water)
- 1litre = 0.22 gals
= 1000 cm³
= 1 kg (water)

$$1000 \text{ litre} = 1 \text{ m}^3$$

- Weight** 1lb = 0.45kg
1kg = 2.21 lbs

- Pressure** 1 bar = 14.5 psi = 100kN/m²
1 ft head of water = 0.434 psi
1 m head of water = 9.8kN/m²

- 1 kilocalorie (kcal) = the heat required to raise 1kg of water through 1°C
= 4187 Joules
= 3.97 Btu

- 1 British Thermal Unit (Btu) = the heat required to raise 1lb of water through 1°F
= 17.6 watt minutes
= 0.252 kcal

- 1 kW Hour = 3412 Btu
= 860 kcal

- 1 joule = 1 watt second (Ws)

Performance Calculations

$$\text{Litres per minute flow} = \frac{\text{kW Loading x 14.3}}{\text{Temp rise } ^\circ\text{C}}$$

$$\text{Temp rise } ^\circ\text{C} = \frac{\text{kW Loading x 14.3}}{\text{Litres per minute flow}}$$

$$\text{Temp rise } ^\circ\text{F} = \frac{\text{kW Loading x 5.7}}{\text{Gallons per minute flow}}$$

$$\text{kW loading required} = \frac{\text{Litres x Temp Rise } ^\circ\text{C}}{\text{Time in minutes x 14.3}}$$