



U.S. Gallons per Hour No. 2 Fuel Oil

Rate gph @ 100 psi	Operating Pressure: Pounds per Square Inch							
	125	140	150	175	200	250	275	300
.40	.45	.47	.49	.53	.56	.63	.66	.69
.50	.56	.59	.61	.66	.71	.79	.83	.87
.60	.67	.71	.74	.79	.85	.95	1.00	1.04
.65	.73	.77	.80	.86	.92	1.03	1.08	1.13
.75	.84	.89	.92	.99	1.06	1.19	1.24	1.30
.85	.95	1.01	1.04	1.13	1.20	1.34	1.41	1.47
.90	1.01	1.07	1.10	1.19	1.27	1.42	1.49	1.56
1.00	1.12	1.18	1.23	1.32	1.41	1.58	1.66	1.73
1.10	1.23	1.30	1.35	1.46	1.56	1.74	1.82	1.91
1.20	1.34	1.42	1.47	1.59	1.70	1.90	1.99	2.08
1.25	1.39	1.48	1.53	1.65	1.77	1.98	2.07	2.17
1.35	1.51	1.60	1.65	1.79	1.91	2.14	2.24	2.34
1.50	1.68	1.77	1.84	1.98	2.12	2.37	2.49	2.60
1.65	1.84	1.95	2.02	2.18	2.33	2.61	2.73	2.86
1.75	1.96	2.07	2.14	2.32	2.48	2.77	2.90	3.03
2.00	2.24	2.37	2.45	2.65	2.83	3.16	3.32	3.46
2.25	2.52	2.66	2.76	2.98	3.18	3.56	3.73	3.90
2.50	2.80	2.96	3.06	3.31	3.54	3.95	4.15	4.33
2.75	3.07	3.25	3.37	3.64	3.90	4.35	4.56	4.76
3.00	3.35	3.55	3.67	3.97	4.24	4.74	4.97	5.20
3.25	3.63	3.85	3.98	4.30	4.60	5.14	5.39	5.63
3.50	3.91	4.14	4.29	4.63	4.95	5.53	5.80	6.06
3.75	4.19	4.44	4.59	4.96	5.30	5.93	6.22	6.50
4.00	4.47	4.73	4.90	5.29	5.66	6.32	6.63	6.93
4.50	5.04	5.32	5.51	5.95	6.36	7.11	7.46	7.79
5.00	5.59	5.92	6.12	6.61	7.07	7.91	8.29	8.66
5.50	6.15	6.51	6.74	7.27	7.78	8.70	9.12	9.53
6.00	6.71	7.10	7.35	7.94	8.49	9.49	9.95	10.39
6.50	7.26	7.69	7.96	8.60	9.19	10.28	10.78	11.26
7.00	7.82	8.28	8.57	9.25	9.90	11.07	11.61	12.12
7.50	8.38	8.87	9.19	9.91	10.61	11.86	12.44	12.99
8.00	8.94	9.47	9.80	10.58	11.31	12.65	13.27	13.86
8.50	9.50	10.06	10.41	11.27	12.02	13.44	14.10	14.72
9.00	10.06	10.65	11.02	11.91	12.73	14.23	14.93	15.59
9.50	10.60	11.24	11.64	12.60	13.44	15.02	15.75	16.45
10.00	11.18	11.83	12.25	13.23	14.14	15.81	16.58	17.32
10.50	11.74	12.42	12.86	13.89	14.85	16.60	17.41	18.19
11.00	12.30	13.02	13.47	14.55	15.56	17.39	18.24	19.05
12.00	13.42	14.20	14.70	15.88	16.97	18.97	19.90	20.79

R.W. **BECKETT** CORPORATION

U.S.A.: P.O. Box 1289 • Elyria, Ohio 44036 • 800-645-2876 • 440-327-1060 • FAX 440-327-1064

Canada: R.W. Beckett Canada, Ltd. • Unit 3 - 430 Laird Road • Guelph, Ontario, N1G 3X7

800-665-6972 • FAX 519-763-5656

Form No. 61207 R794 Printed in the U.S.A. ©R.W. Beckett Corporation

Helpful Conversion Factors for Heating Systems

Multiply...	by...	to obtain...
Atmosphere (atm)	14.70	lb. per sq. in. (psi)
Boiler Horsepower	34.50	pounds steam/hr @ 212 °F
Boiler Horsepower	33,475	BTU per hour
Cubic feet (cu.ft.)	7.481	gallons (gal.)
Degrees - Centigrade (°C)	(°C x 1.8) + 32	degrees - Fahrenheit (°F)
Degrees - Fahrenheit (°F)	(°F - 32) x 5/9	degrees - Centigrade (°C)
Gallon, # 2 Oil	7.1	pounds (lbs.) approx.
Gallon, Water	8.337	pounds (lbs.)
Horsepower	.3	GPH
Horsepower - U.S. & British	33,000	foot pounds per minute
Horsepower - U.S. & British	42.42	BTU per minute
Inches Mercury (in. Hg)	13.60	inches water (in. w.c.)
Inches Mercury (in. Hg)	0.4912	pounds per square in. (psi)
Inches Water (in. w.c.)	0.0735	inches mercury (in. Hg)
Inches Water (in. w.c.)	0.0361	pounds per square in. (psi)
Kilocalorie (kcal)	.0284	GPH
Kilocalorie (kcal)	3.968	BTU
Kilogram/hr (kgh)	.3125	GPH
Kilowatt (kw)	.0244	GPH
Kilowatt hours (kwh)	3,413	BTU
Kilowatt (kw)	1.341	horsepower - U.S. & British
Liter	.2642	GPH
Pound - Steam @ 212°F	970.3	BTU (heat of evaporation)
Sq. Ft. Steam	240	BTU
Sq. Ft. Water	150	BTU
Watt Hour (whr)	3.413	BTU

Multiply...	by...	to obtain...
BTU input	140,000	GPH #2 Oil
Gross Sq. Ft. Steam	360	GPH #2 Oil
Net BTUH (Output)	112,000	GPH #2 Oil
Net MBH (Output)	112	GPH #2 Oil
Net Sq. Ft. Steam	466	GPH #2 Oil
Sq. Ft. Heating Surface	27	GPH #2 Oil

Boiler Tube Sizing Pg. 7-205 Hoffman data book

$$\frac{\text{Sq.Ft. heating surface} \times 1.5}{10} = \text{Hp} \times 3 = \text{Gph}$$

Water Capacity Per Foot of Pipe

Pipe Size	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	3-1/2"	4"	5"	6"
Gallons Per Foot	.016	.023	.040	.063	.102	.17	.275	.39	.53	.69	1.1	1.5

Most Common pipe sizes	Sq. Ft. of surface (ext) per 1 foot pipe
3" pipe	0.916
3-1/2" pipe	1.047
4" pipe	1.178

How to Figure Domestic Water

1 gal. #2 oil per hr. = 140,000 BTUH
 140,000 x 80% = 112,000 gross BTUH

1 gal. water = 8.3 lb.
 To raise 1 lb Water 1°F = 1 BTU
 To raise 8.3 lb Water 100°F in
 1 minute = 8.3 x 100°F = 830 BTU/min.
 To raise 8.3 lb Water 80°F in
 1 minute = 8.3 x 80 = 664

$\frac{112,000 \text{ BTU Gross hr.}}{60 \text{ min}} = 1866.66 \text{ BTU Gross per min}$

$\frac{1866.66}{830} = 2.2489 \text{ gal. per min } 100^\circ\text{F rise.}$

$\frac{1866.66}{664} = 2.81 \text{ gal. per min } 80^\circ\text{F rise.}$

664

40°F inlet water + 100°F rise = 140°F
 40°F inlet water + 80°F rise = 120°F

Oil Pressure vs. Nozzle Flow Rater Conversion

- Divide new pressure by 100 psi (Standard nozzle pressure)
 EXAMPLE: $140 \div 100 = 1.4$
- Obtain square root. (Use calculator)
 EXAMPLE: $1.4 \sqrt{\quad} = 1.1832159$
- Multiply result by nozzle size at 100 psi.
 EXAMPLE: $1.1832159 \times 1.00 = 1.18 \text{gph}$
 This is your new gph flow rate @ 140 psi