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1,000 HP FIRETUBE BOILER

Maximum BTU/hr Input (ie: Rated Input @ High Fire / 100% Input Rating)	$1,000 \times 42,000 = 42,000,000$ BTU
Cubic Feet of Natural Gas Required	$42,000,000 \div 1,000 = 42,000$ Cu Ft
Cubic Feet of Vaporized Propane Required	$42,000,000 \div 2,500 = 16,800$ Cu Ft
Gallons of Liquid Propane Required	$42,000,000 \div 91,600 = 458.51$ Gallons
Gallons of #2 Diesel Oil Required	$42,000,000 \div 140,000 = 300$ Gallons
Minimum BTU/hr Input at a 4:1 Turndown Ratio (Low Fire)	$42,000,000 \div 4 = 10,500,000$ BTU
Cubic Feet of Natural Gas Required	$10,500,000 \div 1,000 = 10,500$ Cu Ft
Cubic Feet of Vaporized Propane Required	$10,500,000 \div 2,500 = 4,200$ Cu Ft
Gallons of Liquid Propane Required	$10,500,000 \div 91,600 = 114.62$ Gallons
Gallons of #2 Diesel Oil Required	$10,500,000 \div 140,000 = 75$ Gallons
Maximum Steam Production in lbs/hr (High Fire)	$1,000 \times 34.5 = 34,500$ lbs/hr
Maximum Water Evaporation Rate	$1,000 \times .069 = 69$ GPM
Minimum Feedwater Pump Flow (on / off pump strategy)	$69 \times 2 = 138$ GPM
Minimum Feedwater Pump Flow (modulating pump strategy)	$69 \times 1.5 = 103.5$ GPM
Minimum Feedwater Tank Storage Requirement	690 Gallons
Steam Temperature at <u>210 psi</u> Saturated	390 °F
BTU/hr Output, Based on 80% Efficiency at High Fire	$42,000,000 \times .80 = 33,600,000$ BTU
BTU/hr Output, Based on 80% Efficiency at Low Fire	$10,500,000 \times .80 = 8,400,000$ BTU
Square Feet Heating Surface (sq. ft. HS) at 5 sq. ft. per HP	$1,000 \times 5 = 5,000$ Sq Ft
Minimum Steam Safety Relief Valve Capacity at Boiler Design	$34,500 \times 1.10 = 37,950$ lbs/hr
Minimum Water Softener Flow Capacity at High Fire (always based upon 100% input)	$69 \times 2 = 138$ GPM

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