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475 HP FIRETUBE BOILER

Maximum BTU/hr Input (ie: Rated Input @ High Fire / 100% Input Rating)	$475 \times 42,000 = 19,950,000$ BTU
Cubic Feet of Natural Gas Required	$19,950,000 \div 1,000 = 19,950$ Cu Ft
Cubic Feet of Vaporized Propane Required	$19,950,000 \div 2,500 = 7,980$ Cu Ft
Gallons of Liquid Propane Required	$19,950,000 \div 91,600 = 217.8$ Gallons
Gallons of #2 Diesel Oil Required	$19,950,000 \div 140,000 = 142.5$ Gallons
Minimum BTU/hr Input at a 4:1 Turndown Ratio (Low Fire)	$19,950,000 \div 4 = 4,987,500$ BTU
Cubic Feet of Natural Gas Required	$4,987,500 \div 1,000 = 4,987.5$ Cu Ft
Cubic Feet of Vaporized Propane Required	$4,987,500 \div 2,500 = 1,995$ Cu Ft
Gallons of Liquid Propane Required	$4,987,500 \div 91,600 = 54.44$ Gallons
Gallons of #2 Diesel Oil Required	$4,987,500 \div 140,000 = 35.6$ Gallons
Maximum Steam Production in lbs/hr (High Fire)	$475 \times 34.5 = 16,387.5$ lbs/hr
Maximum Water Evaporation Rate	$475 \times .069 = 32.7$ GPM
Minimum Feedwater Pump Flow (on / off pump strategy)	$32.7 \times 2 = 65.4$ GPM
Minimum Feedwater Pump Flow (modulating pump strategy)	$32.7 \times 1.5 = 49.05$ GPM
Minimum Feedwater Tank Storage Requirement	328 Gallons
Steam Temperature at <u>200 psi</u> Saturated	387 °F
BTU/hr Output, Based on 80% Efficiency at High Fire	$19,950,000 \times .80 = 15,960,000$ BTU
BTU/hr Output, Based on 80% Efficiency at Low Fire	$4,987,500 \times .80 = 3,990,000$ BTU
Square Feet Heating Surface (sq. ft. HS) at 5 sq. ft. per HP	$475 \times 5 = 2,375$ Sq Ft
Minimum Steam Safety Relief Valve Capacity at Boiler Design	$16,387.5 \times 1.10 = 18,026.25$ lbs/hr
Minimum Water Softener Flow Capacity at High Fire (always based upon 100% input)	$32.7 \times 2 = 65.4$ GPM

HQ - Fremont, CA (510) 490-7100 / Sales Office - Visalia, CA (559) 623-9318
Controls Division - Pacific Combustion Engineering - Washougal, WA (360) 335-1443
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