

POWELL RIVER NO. 1 CHEMICAL RECOVERY BOILER

Design Specifications:

		<u>Heating Surfaces</u>	<u>Sq. Ft.</u>
*Capacity – D.S. /24 Hrs	2,400,000	Boiler	26,460
*Capacity – D.S. /Hr	100,000	Furnace	15,020
Furnace Width	26' -10-31/32"	Superheater	33,400
Furnace Depth	29' -1-3/8"	Economizer	20,540
Boiler Width	---	Air Heater (Steam)	12,740
Furnace Volume	84,960	Screen	
		TOTAL	111,960

Performance Conditions:

Design Pressure lbs./sq.in.	1,020
Operating Pressure lbs./sq.in.	915
Total Steam Temperature - °F	825
Feedwater Temperature - °F	350
Air Temperature to Air Heater - °F	80
Air Temperature to Furnace - °F	300
Gas Temperature Leaving Evaporator - °F	315
Black Liquor Temperature to Evaporator - °F	200
*Density of Liquor to Evaporator - % Solids	50
Total Salt Cake per Average Ton of 3000 lbs. Dry Solids (makeup and precipitated)	125

Fuel Analysis (Dry Solids Basis):

	<u>Average</u>	<u>Black Liquor Customer Specifications</u>
Carbon	%	39.70
Hydrogen	%	3.93
Oxygen plus Nitrogen	%	32.50
Sulphur	%	3.76
Sodium	%	20.11

*High Heat Value BTU/lb. 6,600

* Salt Cake Free

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Heat Balance:

Basis = One lb. Dry Solids (Salt Cake Free)

Datum Temp.	°F.	-	32 x 80
Excess Air	%		13
Solids	%		50

Input:

Heat in Dry Solids	6,600
Heat in Preheated Air from Air Heater	278
Sensible Heat in Liquor	180
Heat in Moist Air	-
Heat in Steam to Liquor Heater	44
TOTAL INPUT	7,102

Distribution:

Water Vapor Loss all sources	1,612
Dry Gas Loss	307
Reduction of Salt Cake	552
Heat of Fusion and Sensible Heat in Smelt	217
Unaccounted For	274
Radiation	48
Heat Available for Steam	4,092
TOTAL DISTRIBUTION	7,102

Predicted Performance:

Based on previously specified performance conditions and fuel analysis.

Lbs. steam generated per lb. of dry solids	-	3.775
Average steam flow	-	377,500 # / Hr.
Total Steam Flow	-	9,060,000 # / 24 Hrs.
Capacity in terms of dry solids / 24 Hrs. (salt cake free)	-	2,400,000
Capacity in lbs. steam / 24 Hrs. (actual conditions)	-	9,060,000

The average solids content in the steam leaving the drum will not exceed	-	1 P.P.M.
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