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Ecotec Services Ltd.
Orchard Street
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Att. Marc Quainton

Our ref.:
Your ref.:
Order no.: O3319
Date: 06.12.2019

Justsen Hot Water Boiler System type JWB 1.0 MW – 6.0 bar(g), 110 °C

System data:

The system data below are assuming no supporting oil burner in operation to maintain the guaranteed temperature 850 °C for 2 seconds in the after combustion chamber. Justsen is taking no responsibility for the load on the oil burner. However, it is estimated to be in the range 20-50% of the combustion capacity depending on where in the capacity diagram the boiler system is operated. This corresponds to the wood waste fuel consumption decreasing by the corresponding value.

Max. heating output:	1.0 MW
Design pressure:	6.0 bar(g)
Min. operating pressure:	1.5 bar(g)
Design temperature:	110 °C
Flow temperature:	105 °C
Min. return temperature:	90 °C
Air surplus factor (Lambda) at 100% load:	1.48 at MCR*
O_2, dry at 100% load:	7.0% at MCR*
Flue gas temperature at 100% load:	160 °C at MCR*
Thermal efficiency at 100% load:	87.8%
Fuel consumption at 100% load:	269 kg/h
Combustion capacity at 100% load:	1,138 kW
Grate length:	2,450 mm (7 fixed steps, 6 moving steps)
Grate width:	1,240 mm (1 row of 3 hydraulic cylindres)
Ratio length vs. width:	1.98:1
Grate area:	3.04 m^2
Thermal grate load:	375 kW/m^2
Grate load:	89 $kg/h/m^2$
Combustion air amount, wet:	1,620 Nm^3/h = 1,739 m^3/h at 20 °C
Flue gas amount, wet:	1,835 Nm^3/h = 2,910 m^3/h at 160 °C
Flue gas moisture by weight:	7.94%
Combustion chamber volume*:	6.71 m^3
Flue gas retention time*:	3.20 s
Recommended chimney core diameter:	250 mm for flue gas velocity 16.5 m/s

*) Measured after the last addition of combustion air and before the first boiler tube pass at an average flue gas temperature of 850 °C.

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Reference values*:		
	Fuel temperature:	20 °C
	Ambient air temperature:	20 °C
	Relative air humidity:	35%
	Fouling factor:	0.0030 m^2 k/w

*) Forms the basis for thermal calculations and should not be confused with allowed values.

Design fuel: Wood waste grade C.

Data:		
	- calorific value (H_{awf}*):	5.31 kWh/kg = 19.117 MJ/kg
	- net calorific value (H_u):	4.23 kWh/kg = 15.235 MJ/kg
	- water:	16.6% based on total weight
	- ash:	1.9 based on dry weight
	- Hydrogen (H):	5.86% based on dry weight
	- Carbon (C):	49.87% based on dry weight
	- Sulphur (S):	0.06% based on dry weight
	- Nitrogen (N):	0.97% based on dry weight
	- Chlorine (Cl):	approx. 0.02% based on dry weight
	- Potassium (K):	approx. 0.10% based on dry weight
	- particle size distribution:	ÖNORM M 7133 G50
	- max. length of particles:	120 mm
	- expected density:	150 kg/m^3

*) Ash and water free.

Brabrand 06.12.2019
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