

Biomass Boiler Information Request Form

In common with other types of combustion appliances, biomass boilers are potentially a source of air pollution. Pollutants associated with biomass combustion include particulate matter (PM₁₀/PM_{2.5}) and nitrogen oxides (NO_x) emissions. These pollution emissions can have an impact on local air quality and affect human health. It is essential that any new biomass boilers installed in the East Riding of Yorkshire meet certain emission control requirements in order to protect local air quality.

In order to approve a planning application associated with a biomass boiler, the following information below must be supplied to the local authority.

You may find the Carbon Trust publication 'Biomass heating: a practical guide for potential users' a useful companion when completing this form. The publication can be downloaded from <https://www.carbontrust.com/resources/guides/renewable-energy-technologies/biomass-heating-tools-and-guidance/#biomass-guides> (free registration required)

1. Development Details

a) Planning Application Reference	PP-09372188
b) Name of Site	Service Timber Limited
c) Address where boiler(s) will be located	Timber Terminal Brighton Airfield Bubwith YO8 6DJ
d) Person completing form	Peter James
e) Contact telephone number	[REDACTED]

2. Particulars of the Boiler

This information on the basic design of the system will help us assess the emissions performance. Biomass boilers often produce relatively high emissions when lightly loaded, hence the question regarding an accumulation tank (heat store). The boiler manufacturer and/ or installer should be able to help you provide this information.

a) Describe the proposed biomass boiler including make, model, manufacturer, thermal capacity (kw/MW), efficiency, maximum rate of fuel consumption (kg/hr or m ³ /hr).
Herz Firematic 501 wood chip biomass boiler with maximum 499kW output, combustion efficiency 93.8%. Clean Air Act from October 2015. Maximum chip consumption rate = 144 kg/hr @ W25.

b) Describe the boiler combustion system and how combustion will be optimised and controlled.

A built in lambda probe, which monitors continuously the flue gas values, detects fuel quality changes and ensures optimum combustion and low emission values.

The Lambda probe controls the primary and secondary air supply ensuring complete combustion, even in partial load operation.

The results are low fuel consumption and the lowest emission values even with different fuel qualities.

c) Describe the fuel feed system.

Wood chips or pellets are transported from the side into the combustion chamber (with double stoker screw).

The movement of the step grate is also a cleaning mechanism of the burning chamber. These grate elements consist of special, high-quality cast iron. Through the movement of the step- /moving grid the biomass is transported through the combustion area.

The cleaning of the combustion chamber from burning ash is carried by an automatically tipping grid. The screw below transports the ash directly into the ash bin.

No manual cleaning requirement.

d) Provide details of the abatement equipment in place for controlling particulate matter (fly ash) emissions.

With a flexible screw the combustion and fly ash is transported automatically into an ash container with a capacity of 240 litres.

e) How does the biomass boiler deal with variable heat loads – is the boiler linked to an accumulation tank?

The boiler is linked to an accumulator tank of recommended minimum capacity of 10000 litres.

f) Is the biomass boiler an exempt appliance in accordance with the Clean Air Act 1993? If yes provide evidence to demonstrate the biomass boiler has been tested and certified as an exempt appliance (for example a link to the appliance on the UK Smoke Control Areas website <http://www.uksmokecontrolareas.co.uk/appliances.php>)

Defra	Appliance: Herz Firematic 349 (349kW), 401 (401kW) and 499 (499kW) boilers
Smoke control areas	« Return to Exempt Appliances
Authorised fuels	The appliances listed below are exempt in the relevant country or countries when using the specified fuel(s), when operated in accordance with the instruction and installation manuals and when any conditions are met.
Exempt appliances	
Search for fuels & appliances	
	Available information about this appliance is shown below:
	Download as PDF Download as CSV
Appliance name	Herz Firematic 349 (349kW), 401 (401kW) and 499 (499kW) boilers
Output	n/a
Fuel Type	Wood based
Appliance Type	Boiler
Manufacturer	Herz Energietechnik GmbH, Herstraße 1, 7423 Pinkafeld Austria
	The fireplace must be installed, maintained and operated in accordance with the following specifications:
Instruction manual title	See conditions if applicable
Instruction manual date	See conditions if applicable
Instruction manual reference	See conditions if applicable
Installation manual title	See conditions if applicable
Installation manual date	See conditions if applicable
Installation manual reference	See conditions if applicable
Additional conditions	Operating Instructions dated December 2014 reference "Betriebsanleitung_Firematic_20_499_Touch_Englisch_V1.4 " and supplementary document dated 28th April 2015 reference "CleanAirAct1993_20150507HERZ-ET"
Permitted fuels	Wood Chips ¹ and wood pellets ¹
England Status	Exempt (Footnote 4)
Date first exempt	See Footnotes or SI Link
Wales Status	Exempt (SI 2016 No. 811)
Date first exempt	19/01/2017

3. Boiler Operation and Maintenance

System efficiency and emissions performance very much depend upon regular maintenance. Your installer should be able to recommend a suitable maintenance schedule.

a) Describe arrangements for cleaning and de-ashing the boiler.

Automatic De-ashing

Via the two ash discharge screws the combustion and fly ash is automatically augered into the ash bins. There is the possibility of fully automatic ash removal into an external, bigger ash container. Due to the bigger volume of ash container the intervals for empty the containers are not so often.

b) Provide details of the maintenance schedule associated with boiler, abatement equipment and stack. This should include frequency of boiler inspection and servicing by a trained boiler engineer.

A biomass boiler service contract will be in place in association with the other biomass boilers on the site and will include:

- Full service and safety inspections.
- Boiler combustion optimisation.
- Interim service.
- Weekday technical telephone support.
- Boiler heat meter check.
- Flue cleaning.

c) Describe how incidences of boiler or abatement system failure are identified & mitigated.

A fully commissioned Herz T-Control system with additional option of remote visualisation and remote maintenance will be installed to control the biomass boiler system. The T-Control will be linked to a smartphone, PC and/or tablet PC that provides handling the same as in the touch controller directly in the boiler providing status and error messages via email to the operator and the maintenance engineer simultaneously.

4. Boiler Stack Details

The design of the stack greatly affects how pollutants produced in the boiler disperse over the surrounding area. Where the area is heavily built up, or has existing air quality issues, dispersion becomes more complicated and a computer modelling technique known as dispersion modelling may be required. Your installer should be able to provide most of the details and make a calculation on stack height and design. When dispersion modelling is required you or your installer may need to engage a specialist consultant.

a) Identify the height of the boiler exhaust stack above ground and provide evidence to demonstrate that predicted emission concentrations associated with the calculated stack height do not have a significant impact on the air quality objectives for NO₂ and PM₁₀.

Height of flue above ground is approx. 7.25 metres

b) Identify stack internal diameter (m).

Flue internal diameter is 450mm.

c) Provide maximum particulate matter and nitrogen oxides emission rates (mg/m³ or g/hr) to standard reference conditions (6% oxygen, 273K, 101.3kPa).

PM = 8 g/GJ

NO_x = 77 g/GJ

d) Identify the exhaust gas efflux velocity (m/s).

The efflux velocity determined from the height and diameter of the flue will prevent the discharged plume suffering from aerodynamic down-wash and flow down the outside of the discharge stack as calculated by the chimney and flue specialist in accordance with the CAAM and D1 guidance notes and achieving the recommended efflux velocity of >7.5m/sec.

e) Provide the grid reference of boiler exhaust stack.

Eastings (x) = 435250

Northing (y) = 472182

5. Fuel Details

Emissions from a biomass boiler depend greatly on the type and quality of the fuel used. Reasonable guarantees are therefore needed that the fuel is compatible with the boiler, is of a high quality and that quality will be assured for a reasonable period of time. Your fuel supplier and installer should be able to provide this information.

a) Describe the fuel specification including origin, type of wood (chips, pellet, briquettes), nitrogen, moisture, ash content (%).

Fuel will be supplied by an approved provider registered on the Biomass Suppliers List (BSL) to also comply with Ofgem Non-Domestic RHI requirements and as recommended by the boiler manufacturer.

b) Does the fuel comply with European or equivalent fuel quality standards such as CEN/TS 335 or ONORM?

Wood chips M40 (water content max. 40%) according to

- EN ISO 17225-4: property class A1, A2, B1 and particle size P16S, P31S
- EN 14961-1/4: property class A1, A2, B1 and particle size P16B, P31,5 or P45A
- ÖNORM M7133: G30-G50

c) Describe what fuel quality control procedures will be adopted to guarantee constant fuel quality from your supplier.

Fuel will be supplied by an approved provider registered on the Biomass Suppliers List (BSL) to also comply with Ofgem Non-Domestic RHI requirements.

d) Provide evidence to demonstrate that the biomass boiler combustion system is applicable to the fuel specification.

Extract from the boiler manufacturers technical information

Split 2-zone combustion chamber

made of SiC fireproof concrete (Temperature resistance up to 1550°C) with step grate (2 zones) made of solid cast chromium steel. The grate bars can be changed individually. Furthermore, the combustion chambers have 2 secondary air zones.

Wood chips M40 (water content max. 40%) according to

- EN ISO 17225-4: property class A1, A2, B1 and particle size P16S, P31S
- EN 14961-1/4: property class A1, A2, B1 and particle size P16B, P31,5 or P45A

– ÖNORM M7133: G30-G50

e) Identify where and how fuel will be stored on site (e.g. bunker or silo).

The wood chip fuel will be stored in a bunker within the building with access through the side of the building for deliveries.

f) Describe how fuel will be unloaded from the delivery vehicle into the storage facility and what control measures will be in place to reduce particulate matter emissions to atmosphere.

Large blower lorry
Wood chip delivery to internal chip store through opening in side of building by large blower lorry.
Or
Tipped deliveries
Tipped delivery using vehicle which lifts its back hydraulically to empty out the wood fuel through the side of the building into the internal wood chip store.

6. Building Details

The height and distance of neighbouring buildings will determine their exposure to emissions from the biomass boiler, and therefore the height of the stack needed. Your architect should be able to provide this information.

a) Record the distance of adjacent buildings from boiler exhaust stack.

There are no adjacent buildings to the building housing the biomass boiler.

b) Record the height of adjacent buildings from boiler exhaust stack.

There are no adjacent buildings to the building housing the biomass boiler.

c) Record the dimensions of building to which the boiler exhaust stack is attached.

The biomass boiler is located inside the building plant room and the flue rises vertically through the roof to terminate above roof level by approx. 2000mm.

d) Indicate the distance from the boiler exhaust stack to the nearest fan assisted intakes and openable windows.

The biomass boiler exhaust stack terminates above roof level and there are no fan assisted intakes or openable windows in the building.

7. Plans

Please attach the following to this form:

- A site plan showing the location of the boiler room, fuel storage area and the access and exit route for fuel delivery vehicles, and
- A site plan showing the position of the boiler exhaust stack, fan assisted intake air vents and nearest openable windows.

8. Returning this form

Please return this form to:

Email: pollution.control@eastriding.gov.uk

Or Post:

Philip Hill

Senior Environmental Control Officer

East Riding of Yorkshire Council

Council Offices

Church Street

Goole

DN14 5BG

This form was prepared as part of the 'Biomass and Air Quality Guidance for Local Authorities' project in June 2009 and is adapted from an original form developed by the London Borough of Camden.