

**27<sup>th</sup> March 2023 - Management Plan for the Operation of a Glen Farrow UK Ltd  
Biomass Boiler Model GF295**

Location - Bekson Farm, 54 Whaddon Lane, Hilperton, Trowbridge, BA14 7RN

The purpose of this document is to ensure that the boiler if operated in order to minimise smoke emissions as set out below and in conjunction with the manufacturers GF295 Boiler Operation and Maintenance Plan and the best practice set out in Section A5 of the Air Quality Assessment and utilise guidance set out within the Process Guidance Note PG1/12(13); Statutory Guidance for Combustion of Waste Wood.

1	Over-filling	Loading of the boiler is undertaken manually. The chamber is filled up to 35% of its volume which is the maximum acceptable it should be subjected to at any one time.
2	Low furnace temperature	The temperature is digitally set and maintained at a constant temperature of between 70-80°C. The chamber is filled at regular intervals during the day to ensure that the temperature is maintained.
3	Inadequate Ventilation	<p>The boiler is fitted with three blower bars, one in the base and two on the sides. The fan located at the rear of these bars is run at 80% of its capacity to push air into the combustion chamber to feed oxygen to the fire. The boiler is cleaned on a weekly basis to ensure that these bars remain free from debris.</p> <p>The main chamber, flue fan chamber, chimney and air tubes are cleaned/swept on a monthly basis to ensure that adequate ventilation is maintained.</p>
4	Fuel with a high moisture content	<p>All loads of biomass fuel are sample checked with a moisture meter to ensure they are within the acceptable moisture content range as specified by Ofgem and accredited to the RHI Scheme.</p> <ul style="list-style-type: none"> <li>• Waste pallets &lt;18%</li> <li>• Soft and/or hard wood logs &lt;23%</li> </ul>

		Any material above this is dried down to the acceptable level using the heat generated by the boiler.
5	Moisture Meter	2 moisture meters to be retained on site at all times.
6	Different fuel type (to that assumed in the assessment)	Only acceptable biomass fuels as registered in our RHI application are used with the moisture content within the ranges stated above. No plastic waste is to be burnt. Any plastic attached to pallets of to be removed prior to burning. No treated/painted wood is to be burnt. Any such wood received is to be rejected for burning, stored in a separate area and a record of its disposal kept.
7	Boiler Waste	All boiler waste is to be removed from site by a licensed waste contractor and a record kept of when this is removed and by whom.
8	Operational Requirement	A daily log is to be kept of weather conditions (including wind directions), times of operation of the boiler (start and finish time noted) and the type and moisture content of all wood burnt.
9	Servicing	A full service is to be undertaken by the manufacturer (or other qualified engineer) on an annual basis and a record kept.
10	Local Authority	All logs/paperwork to be kept and made available to the Local Authority on request. LA to be informed without delay should any problems arise.
11	Break Down	In the event of a breakdown of any key plant associated with the process (e.g. fans, pumps etc), burning operations will cease until a full repair can be effected.

## **Glen Farrow Boiler Operation and Maintenance Plan**

Boiler to be cleaned and de-ashed once a week manually. The heat exchange tubes to be cleaned weekly by brushing them with the wire brush.

Boiler operative will monitor levels of ash and dust deposits in the boiler while loading the boiler and decide if it needs cleaning more often. Boiler stack will be inspected weekly during the boiler cleaning and swept if necessary.

Daily inspections including:

- Check for build-up of ash in the chamber and clearing if necessary
- Check the blower bars are clear of ash and debris
- Check the heat exchange tubes are not blocked
- Check if doors are operating as normal
- The pumps for faults
- Leaks on the pipework and safety pressure relief valve
- Control panel operation and water temperature reading
- Burner fan working and free from blockages
- Heat meter operational
- Area around the boiler is clear of ash and debris

Weekly Inspections

- Clear the ash from the chamber
- Remove and check the blower bars
- Scrape and brush the heat exchange tubes
- Clear the chimney box
- Check the flue for blockages and sweep if necessary
- Check the burner fan for dust and debris
- Check the main pumps
- Check the shunt pump and flow switch operation
- Grease the door bearings

Glen Farrow engineers are available on the phone for any help, advice or assistance at all times.

## **Particulars of the GF295 Biomass Boiler**

Glen Farrow biomass boiler GF295 is 295 KW capacity. Batch fed boiler type boiler. Combustion efficiency reaches approximately 90%. Boiler thermal efficiency is approximately 70%. Boiler fuel burn rate is 30.83 kg/hr.

Glen Farrow GF295 boiler is designed to burn biomass fuel such as wooden logs and straw bales. The boiler is batch fed type boiler, meaning that the fuel is loaded manually through the main door into a combustion chamber.

Combustion is achieved by manually lighting the fuel and with the help of the burner fan the fuel keeps alight. The burner fan, located at the rear of the boiler, is forcing the air through the blower bar into the chamber to achieve intense combustion. Blower bars are positioned to direct the air underneath the fuel for primary ignition processes and deliver the air above the fuel to achieve secondary combustion. The burner fan speed can be controlled manually with the speed controller located at the control panel to suit the heat demand and achieve better combustion performance.

The combustion gases leave the chamber through the heat exchange tubes into the chimney box, where the unburnt fuel particulates settle, and up to the insulated flue, then being discharged into the atmosphere.

The combustion gases are heating water jacket surrounding the chamber and heat exchange tubes. To maximise amount of harvested heat, the door is filled with water which is circulated by a shunt pump at the rear of the boiler. The combustion chamber is built from 10mm thick boiler plate which increases durability of the boiler.

The water jacket around the chamber is 60mm wide and holds approx. 3000 ltr of water. The boiler then is insulated using insulation board and rockwool to minimise heat loss.

The boiler is clad with stainless steel cladding and prime coated and painted trimming.

The GF295 boiler is batch fed type boiler, meaning the fuel is loaded manually through the main door into a combustion chamber by trained personnel.

The boiler will be loaded with small amounts of fuel trying to build the fire up and keep it burning at high temperatures by introducing small amounts of fuel into hot fire when needed. Loading routine will be adjusted to meet the system demand.

The control panel located in the control room, helps the operator to monitor the temperatures and adjust the burn rate by adjusting the burner fan speed.

The boiler chamber will collect most of the ash and some of it will settle in the chimney box, which will be cleaned on a weekly basis.