

Bowland Bioenergy - *Technical Information*

Pdf 4. WOOD FUELS

Wood chips

The major benefit of wood chip fuel is the ability to use it in automated stoker boilers. Fuel chips are contained in a store equipped with a feed auger and an agitator. The agitator is a rotary arm which breaks any tendency for the chip to bridge across the auger in-feed. Each time the boiler demands fuel the auger turns conveying chip from the store and the agitator rotates feeding fuel into the auger. This type of store is located on a lower level than the delivery vehicles, if necessary, underground. It is essential that the store is fully waterproofed.

A new storage system, installed at ground level, takes fuel to the boiler from the top of store, thus eliminating the requirement for an agitator arm. Chip can be delivered by tipping vehicle. The density of wood chip is relatively low with one tonne of oven dry wood chip occupying five cubic metres. The fuel store needs to be larger than that required for pellets for the same heat output.

To ensure fuel is of the correct quality it should be obtained from a supplier who is accredited by HETAS and WOODSURE+ and who can demonstrate that they produce fuel to the standard BS EN 14961. Fuel suppliers who are members of CONFOR's Woodfuel Suppliers Group are demonstrating additional commitment to high quality standards.

The fuel is produced by specialised fuel wood chippers which are able to create chips of a consistent particle size in accordance with the above standards. If fuel is produced by conventional arboricultural chippers the fuel will probably fail to conform to the British Standard. The wide range of chip sizes may well cause feed problems with the sensors on the boilers. In addition, production of long slivers of wood or excessive numbers of fine particles can cause jamming in the feed augers.

Leaves and needles must be excluded and the proportion of bark controlled if excessive ash production with increased risk of clinker formation is to be avoided.

Wood pellets

Wood pellets are produced by compressing small particles of wood such as sawdust in dies within a pellet mill. The pressure in the mill raises the temperature of the wood such that the pellets are held together by their natural resins. Some smaller pellet mills utilise additives such as plant oil or steam to increase production rates.

Pellet sizes cover a wide range with 6 or 8mm diameter being the most common. Pellet length is random as a result of breakage as they come out of what is essentially a large mincing machine.

Pellets are also covered by the British Standard TS 14961 which determines the tolerances on length and diameter together with their hardness, ash content etc. The EN+ Standard is the highest quality currently operating in the UK. To comply with this Standard, pellet composition and the means by which it is handled and delivered must comply with the specified procedure. It is vitally important that this fuel is kept dry as only a small amount of moisture can cause disintegration of the pellets with consequent problems in the feeding mechanism and reduced heat production. Water contamination will prevent fuel combustion if present in other than very small quantities.

Pellets are a free flowing fuel with a density of approx 600kg per cubic metre. This, together with their smooth shape, means pellets can be stored in a conventional silo with transfer to the boiler firebox by either an auger or a pneumatic system.

Hand loading of the integrated store, with gravity feed to the fire grate, is the method of fuelling smaller boilers. Pellets must be free from dust (less than 1%) if the gravity feed system is to function effectively. Dust accumulation can result in burn back of fuel in the feed tube resulting in operation of the safety cut out, causing the fire to be extinguished.

Briquettes

These are produced by the same method as pellets but are considerably larger. They can be burned in boilers or conventional fires, taking the place of logs. Being compressed wood they are denser than conventional logs - this together with their low moisture content (less than 10%) results in their heat output and burning time being considerably greater than logs. As with pellets this fuel must be kept dry at all times to ensure satisfactory combustion.

Logs

Logs must be of a suitable size to fit the fire box. The amount of space they occupy in storage varies with the neatness of the stack. Logs should be stored where air can freely circulate and must be covered to prevent re-wetting. At least one full summer's drying is required to give the best energy yield. They should be at 25% moisture content or less for optimum burning performance.

Bowland Bioenergy, based in Lancashire, produces dried wood chips – and supplies wood pellets – for wood burning boilers. The company was founded in 2005 and has grown to be one of the North's leading biomass companies. Wood fuel of the highest quality (BS EN 14961) is produced year-round and the company was the first biomass supplier to achieve the prestigious HETAS Accreditation for wood chip.

Bowland Bioenergy Ltd, Smithfield Farm, Twiston Lane, Downham, Clitheroe, BB7 4DF.

Telephone: 01200 440437

Email: info@bowlandbioenergy.co.uk

Please visit our website www.bowlandbioenergy.co.uk

