

# Safety Guidelines for Operation of the Top-lit Updraft (TLUD) Biochar Oven

## 1. Overview

These guidelines apply to the operation of the Top-lit Updraft (TLUD) biochar ovens (60 litre to 205 litre size)\*. They aim to ensure the safety of users of the TLUD, the safety of the general public (especially children) as well as to minimise environmental impacts and associated complaints, especially associated with smoke and fire risk. The main fire risk includes sparks and embers. A fine steel mesh is applied to the top of the chimney stack to prevent these being emitted.



Figure 1 A top-lit updraft (TLUD) biochar oven (60L)

## 2. Responsible person

The TLUD should be operated by a responsible person over the age of 18 and a member of the Transition Town Vincent (TTV) who has instruction in the use of the TLUD. The TLUD should be supervised at all times while operating and until the char has been thoroughly quenched with water so that it is no longer hot, smoking or steaming.

## 3. Safety

For safety reasons the following should be available to the responsible person and located near the TLUD:

- A large bucket of water (20L)

- Heat resistant gloves e.g. welders gloves

An exclusion fence should be erected at a minimum distance of 1.5m around the TLUD where children may be present.

Heat proof gloves should be used whenever handling the TLUD to prevent burns but also cuts and scratches from the metal.

Potential inflammable materials should be kept away from the TLUD.

#### 4. Biomass size and moisture content

Use should be made of the following forms of biomass:

- Wood chips with a size of between 3-6cm
- Wood branches with a diameter of between 3-6cm

A wood moisture meter should be used to ensure that the moisture content of the wood is less than 20 percent. This is to ensure efficient charring and to minimise smoke.

Small steel cannisters with holes and containing things such as dry grass, mulch and nuts (e.g. Queensland Box tree) may also be used in the TLUD.

#### 5. Period of operation

The operation of the TLUD should be undertaken during the following periods:

- Outside of fire bans
- April through to October
- Weekdays
- Between the hours of 9am to 3pm

Consideration should be given to wind direction and strength to minimise the unlikely risk of any smoke going over residential and commercial areas.

Demonstrations of the TLUD may occur on weekends and outside the recommended hours.

#### 6. Quenching the biochar

Once the biomass has been sufficiently charred, it should be quenched with water in the TLUD before being tipped onto a hard surface (e.g. bitumen/concrete) or a sand surface. It should then be quenched until no more steam is generated.

Ensure that the biochar is fully cooled to ambient temperature in the absence of air, or filled with water, before standing in air. Biochar that is incorrectly produced (e.g. not fully charred), or insufficiently cooled or wetted can self-combust.

## 7. Shipping and storage

For safety, when storing or shipping, ensure the biochar has a minimum of 30% water in it when at ambient conditions. This will suppress dust particles and fire-risk.

### Notes

\* TLUDs much larger than this and processing over 10 tonnes or more charcoal per year could potentially be categorised as prescribed premises under Schedule 1 (Category 37 – Char manufacturing) of Environmental Protection Act Regulations 1987.

### References

Joseph, S. and Taylor, P. (2024) A farmer's guide to the production, use and application of biochar. Australia New Zealand Biochar Group.

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