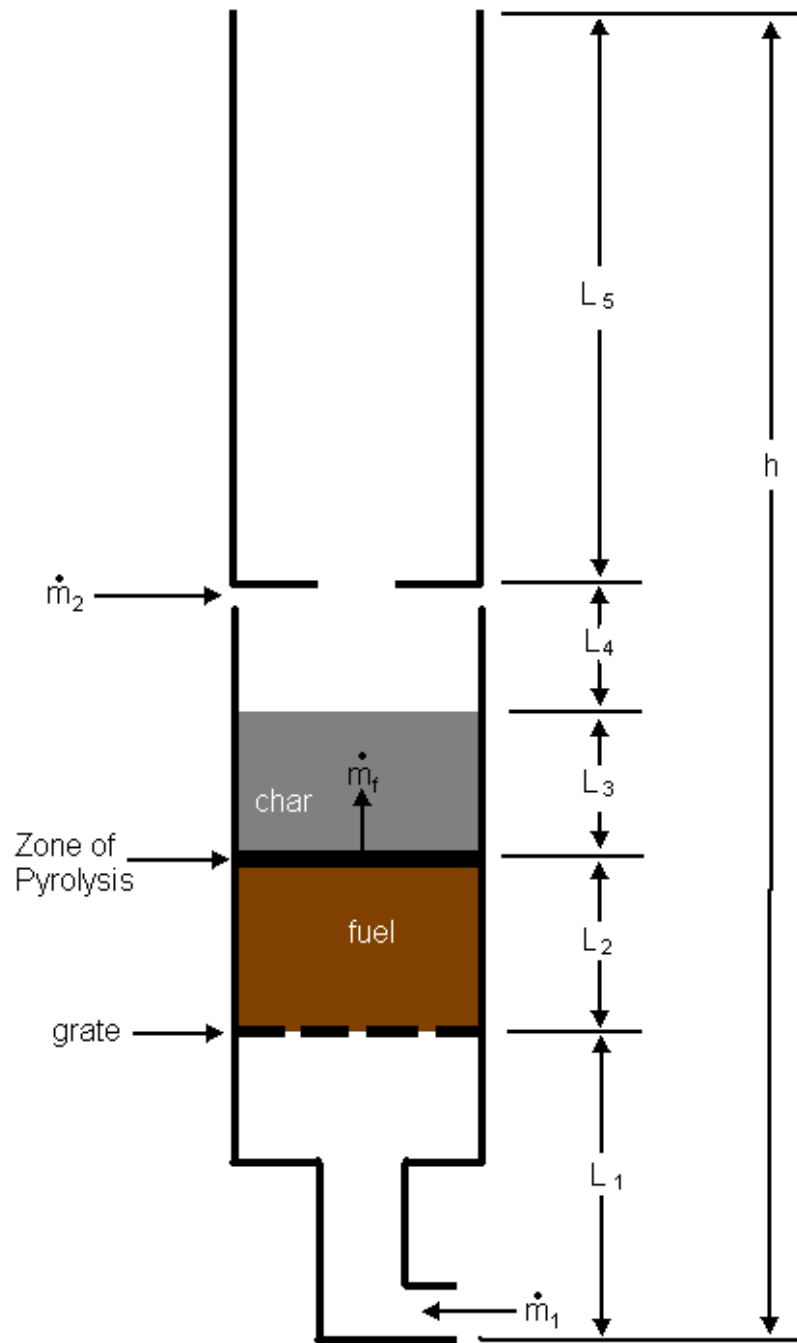


A Report on Some Experiments with the Top-Lit Up Draft (TLUD) Stove

- Dale Andreatta, Ph.D., P.E.

The goal was to take an interesting stove design and apply more science than had previously been applied.





Advantage #1

- Simple design
- Non-critical dimensions
- No fan
- The “stove” is not a specific design but a collection of ideas that can be made in a number of ways.

Advantage #2

- Super clean burning
- 5 mg Particulate Matter per liter
- 0.5 g of CO per liter
- Cleaner than a fan powered stove

Advantage #3

- Easy to control
- Burns for a long time with little or no user intervention (with the right fuel)

Advantage #4

- Can be powerful (short time to boil)
- Can be reasonably efficient
- Exit temperature is generally 600-800 C

Disadvantages

- Fuel-sensitive (a fan would help a lot in this respect)
- Sensitive to how the fuel is packed

The Report Contains

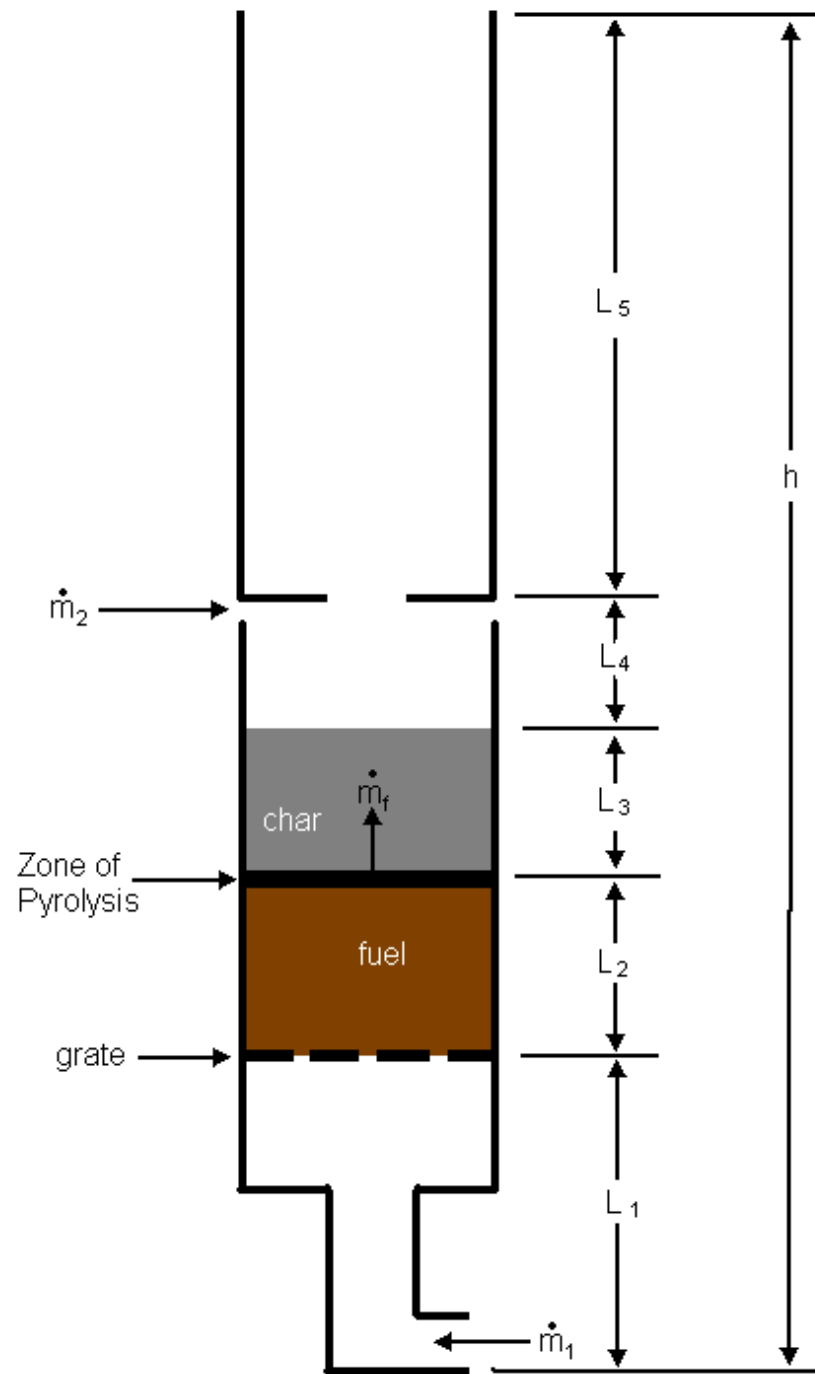
- Detailed description of the stove, its design, construction, and operation.

The Report Contains

- Detailed description of tests done with a variety of fuels.

The Report Contains

- What happens when primary air is controlled, for a variety of fuels for a variety of flow rates.



As a function of primary air flow

- Measure fuel burning rate
- Measure flame height
- Calculate air to fuel ratio
- Calculate equivalence ratio

The Report Contains

- A rough chemical analysis of the pyrolysis process.

The Report Contains

- A rudimentary mathematical model of the stove.