



Rocket Stove Update from Southern Africa

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Since August of 2003
ProBEC, the *Programme for Biomass Energy Conservation in Southern Africa*,
has introduced the Rocket stove into
Lesotho, Malawi, Mozambique,
Zambia, and South Africa,

Rocket Stoves have also been introduced to
Uganda in partnership with GTZ –EAP and
into Kenya in partnership with WinRock/
Shell Foundation

In 2005, is to continue our preliminary efforts
in Southern Africa as well as expanding into
Tanzania and Ethiopia



Existing Cooking Systems



In March of 2004, one of our project partners in Malawi (Eastern Produce Tea Estates) asked us to help them design a new stove that would be more fuel-efficient than their existing open fire. The estate cooks for 40 000 people per day so their choice of stove has far reaching impacts on the health of the workers and the forests. The tea estate's open fires use 170 kg of wood to cook corn porridge for 110 people (approx 80.5 kg of cooked food).



Using Rocket stove principles, we built a 100 litre brick Rocket stove that uses only 13 kg of wood to cook the same amount of food.

This stove (not including stainless steel cooking pot) can be built for approx . US\$70



200L Rocket Stove



We also built a 200-litre stove that uses 9.5 kg of wood to cook enough *Nsima* (corn porridge) for 225 people; this is approximately 160 kg less wood to cook twice as much food. Yes, it does seem counterintuitive that the larger 200L stove uses less wood than the 100L. Next year I'll come to Ethos and explain how this works. If you can't wait, you can write me

Results of Controlled Cooking Test of 200L stove



performed by Andi Michel in Malawi in July 2004

FOOD PREPARED:

- 45 kg maize meal (200g / person --> 225 people at the test day)
- 116.4 kg of water
- Rocket stove with stainless steel pot (200Litre)
- Dry wood consumption at boiling point: 6.1429
- Dry wood – (mc: 13.1%) consumption when food is prepared: 7.0994

SPECIFIC STANDARD CONSUMPTION:

SSC boiling 0.0381 kg dry wood/ kg food prepared

SSC food prepared: **0.0440 kg dry wood/ kg food prepared**

This compares extremely well to tests of open fires that were carried out in Lesotho and Malawi. These tests showed an almost unbelievable specific consumption of **.180 – .300 kg dry wood/ kg food prepared**





One of the keys to producing a smokeless Rocket stove is to find inexpensive, local, and durable materials for the combustion chamber. In Malawi, we have been blessed to work with Dedza Pottery. They have helped us produce an insulative refractory brick that is light (0.67 g/cc) and durable. The bricks are made with:

- 22 parts sawdust (sifted through a #10 mesh)
- 3 parts grog (sifted through a #60 mesh)
- 7 parts high temp clay good to 1300C (sifted through a # 30 Mesh medium)

In Lesotho we are using vermiculite binder and ground pumice.

In South Africa we are using vermiculite/cement lined with Kerasil mortar and cement . In Uganda we are using cut pumice stone.

**The bricks are laid up with a high temp mortar that is made from
1 part Grog and 1 part High Temp clay**

1 part grog: the grog is made by mixing two parts sawdust (sifted through a #10 mesh) with one part high temp clay and then fired at 950C for approx 12 hours . Soaking for 2 hours at 950C. Then cooled and sifted through a #60 mesh

After the grog is fired and sifted, it is then mixed with 1 part high temp clay (sifted through a 60 mesh)

This is then made into a runny paste and very thinly applied between the bricks as well as on the inner face of the bricks where it forms a hard layer that will resist abrasion as the sticks enter the feed chamber

No Food Without Fuel Program Rocket stoves for World Food Program

In Lesotho 1,250 stoves have been requested , of which 150 have been produced . Funds are still outstanding for the remainder 1100 stoves

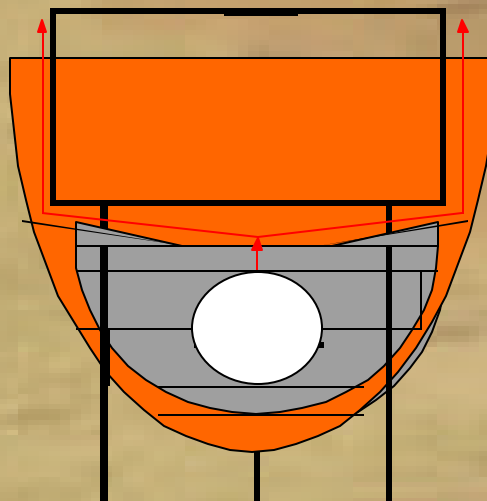
In Malawi, 100 (half 55 gallon drum pot) stoves have been delivered

In Mozambique, 100 stoves have been delivered



More household Rocket prototypes

- In Kenya, a number of modified rocket stoves were made with a shorter chimney. More smoke, but guaranteed heat transfer with a pot that fits directly into the stove body
- In Malawi, it also comes in an 100% ceramic version for the home.



**A 2 pot
restaurant
stove for
Malawi.
(Helped us to
win Silver medal
at the Malawi
Annual Trade
Fair)**



**....and a
cheaper all
mud version
for the house**

