EcoPot: A More Efficient Pot for Wood Fires

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Abstract

1 Introduction

[Put a description of the globabl problem here; I suspect you have good information on that.]

This is a test citation to show what it looks like[**?**]; this actual reference has no bearing on this work.

2 Project History

3 Finned Pot History

4 User Research

The team used contacts in Malawi to do direct, culture-specific user research, even though many cultures cook on open fires with different techniques.

[Put survey and other information here!]

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5 Testing Strategy

Our basic strategy was to design small, 100ml "mini-pots" with a CAD program to be tested with ANSYS simulation software and to order small, affordable 3D printed steel pots based on these designs. The small tests could be tested relatively easily with simple test apparatuses.

6 Initial CAD Designs

Initially the team developed 4 pot designs:

1. Control Pot
2. Full Radial Fins
3. Half-Radia Fins
4. Parallel Fins

7 Mini-pot Test Methodology

Mini-pots were tested for boil time over the burner of a stove using a standard clamp apparatus.

We also constructed a cardboard profile sheet and attempted to do IR imaging on this sheet to verify our understanding of the fluid flow and heat transfer [More needed here.]

7.1 Mini-pot Test Data

8 Constructing large pots

Based on the relative success of the min-pots, large, 12-cup pots were constructed and tested over propate burners and controlled wood fires.

8.1 Rivets and Epoxy

8.2 JetBoil Fins

8.3 Large Pot Test Data

9 Rounded Bottom Designs

Later the team designed a pot using the successful half-radial approach that had a rounded (hemispherical) bottom. The theory was that the Coanda effect would keep the hot gases in contact with the pot. Both Ansys simulation and mini-pot flame testing suggested this is actually true. There is some reason to believe

the rounded-bottom pots may be a more efficient point in the design space than flat-bottomed pots, although they may be more difficult to manufacture.

10 Conclusions

This work demonstrates that pots with heat-exchanging fins can be more efficient than standard pots in some way. If this translates to decreased fuel consumption without inordinate additional expense or loss of durability, these pots may ease fuel gathering burdens, cook faster, and create less pollution than standard pots.